PROCEEDINGS OF THE PUBLIC MEETING

of the

PESTICIDES ADVISORY BOARD

December 14, 1982

TABLE OF CONTENTS

	Pages
Chairman's Welcome	1
Brief submitted by Winnifred Shaw McKee - Representing The Concerned Parents Group.....	3
Brief submitted by J. Ian MacDonald- Representing the New Brunswick Forest Products Commission.....	16
Brief submitted by Hajo Versteeg - Representing the Conservation Council of New Brunswick (1st part).....	18
Brief submitted by Dr. Lucy Dyer - Representing the Conservation Council of New Brunswick (2nd part).....	26
Brief submitted by Blair Hodgson - Representing the New Brunswick International Paper Ltd.....	30
Brief submitted by Larry Fyfe - Representing Fraser Inc.....	37
Brief submitted by D. D. Lockhart - Representing the New Brunswick Forest Products Association.....	48
Brief submitted by Gerald Buyting - Representing the New Brunswick Federation of Agriculture.....	54
Brief submitted by Myles Russell - Representing Russell & Swim.....	59
Brief submitted by John Labossière - Private Citizen.....	63
Brief submitted by David Oxley - Representing J. D. Irving Ltd.....	68
Brief submitted by Carl Harvey - Farmer from Maugerville.....	71
Appendix A, B, C, D, E.....	

CHAIRMAN: Good evening, ladies and gentlemen. My name is Ken Browne and as Chairman of the Pesticides Advisory Board, and Chairman of this public meeting, I wish to welcome you here this evening. At the outset, it may be helpful to review some of the responsibilities of the Pesticides Advisory Board as established under the New Brunswick Pesticides Control Act. The Pesticides Advisory Board is responsible for reviewing all requests received by the Department of the Environment for permits to apply pesticides in the Province of New Brunswick. This review by the Board takes place prior to consideration of such requests by the Minister of the Environment. It is the Minister of the Environment who makes the final decision in regard to such applications. In addition to reviewing permit applications, the Board is also empowered under the Act to review and issue Pesticide Vendor's Licences and Pesticide Applicator's Licences. The prime object of public meetings such as this is to provide members of the public with an opportunity to make presentations on any matter relating to pesticides. A full written transcript of the meeting is subsequently prepared and forwarded to the Minister of the Environment for his consideration. In order to ensure that the transcript accurately reflects the comments of the participants, we will be tape recording this evening's session. I will ask each speaker to identify himself prior to commencing their remarks. In addition, to ensure that the transcript is complete, the members of the Board may ask questions on points of clarification regarding individual presentations or comments from the floor. Basically, the Board is here this evening to listen to the various presentations and ensure that the transcript to be forwarded to the Minister is as accurate and clear as possible.

Before we officially commence the meeting, I want to draw your attention to the table which is located just outside the door where a number of publications prepared by the Department of the Environment are available for all interested parties.

These include the latest report on Pesticides Usage in New Brunswick (1981) - The Safe Handling of Pesticides handbook and a Study on Pesticides Use Practices in a Small Agricultural Watershed. In addition, we have provided copies of the New Brunswick Pesticides Control Act and the amendments to that Act which were passed in the 1982 Legislative Session. Some changes to the Act resulting from these amendments include the following: The Pesticides Advisory Board now has provision for 10 members, the Crown is now bound by the Act, fines for violation of certain sections of the Act have been increased from $1,000 to $50,000. In addition, the Act now provides for the certification of pesticide applicators. Other changes, although significant, were primarily directed toward easing the administration of the legislation. I would now like to introduce the members of the Pesticide Advisory Board:

- On my far right is Mr. Bob Lutes from the Department of the Environment. He's an Industrial Waste Engineer,
- Next, Mr. Steve Hoyt, a Forester from the Department of Natural Resources,
- Mr. Sandy Perley, Plant Pathologist with Department of Agriculture and Rural Development,
- Next, on my immediate right is Mr. Ted Pratt who is Director of the Plant Industry Branch, Department of Agriculture and Rural Development,
- On my immediate left is Dr. Devadason. He is the Coordinator of Public Health Services with the Department of Health,
- Dr. Tooley, Director with the Occupational Health and Safety Commission,
- Dr. Ecobichon, Toxicologist with the Department of Health, and
- Mr. Kirk Gordon, Environmental Planner from the Department of the Environment,
- An additional member is Mr. Norm Prentice who unfortunately was not able to make it here this evening. He is a Wildlife Biologist with the Department of Natural Resources.

Finally, I should mention that all those scheduled to present a brief this evening should identify themselves to the staff

who are located at the table outside the door. We have a total of 11 formal presentations this evening. As Chairman, I will be requesting that those presenting briefs attempt to adhere to the time allocated on the agenda. As I mentioned before, at the end of each presentation, the Board Members will have an opportunity to direct questions of clarification to the presentor. If required and if time permits, I will also ask the presentors if they will entertain questions from the floor. Anyone whose name is not on the agenda and who wishes to present a brief this evening should contact the staff at the registration table. To ensure that we have time to hear all the briefs, we will not be scheduling a coffee break. However, facilities are available outside the door for juice, pop or coffee. I wish to bring to your attention that smoking is prohibited in this room and I would ask representatives of the media to extend every courtesy to those giving briefs and conduct interviews outside the room or at the end of the meeting. Are there any questions regarding the format of the meeting? If not, I would like to call on the first presentor... From Concerned Parents Group... Please identify yourself.

WINNIFRED SHAW McKEE: Mr. Chairman, members of the Board, ladies and gentlemen: I am presenting this brief tonight on behalf of the Concerned Parents Group. This brief has been written by various members of the group. I do apologize that Linda Saunders, the president, is not able to be here tonight. Unforeseen circumstances arose at the last minute.

INTRODUCTION: This brief will deal primarily with issues relative to the forest spraying of insecticides and herbicides which have arisen during the past year. It doesn't attempt to address the full scope of our concerns regarding the spray program, nor the data which prompts those concerns. Appended to this brief is a copy of the Concerned Parents Group's Brief to the Select Committee on the Environment, New Brunswick

Legislature, presented on January 13, 1982. This will provide much more detailed information and should be included in any written proceedings issuing from this hearing. Actually, I neglected to identify myself. I'm Winni Shaw McKee, Secretary for the Concerned Parents Group.

THE 1982 SPRUCE BUDWORM SPRAY PROGRAM: The preparation and execution of the 1982 budworm spray program might charitably be described as organized confusion. In the face of growing public concern about the program's dangers to human health, and growing public scepticism about the program's effectiveness in budworm control, the New Brunswick government commissioned a Task Force on Reye's Syndrome. That task force recommended that:

1) the emulsifier Atlox not be used
2) any substitute emulsifier be non virus-enchancing
3) water formulations are preferable to oil formulations
4) the solvent Cyclosol 63 not be used
5) the solvent Dowanol is OK

This left FPL with the choice of using a water formulation with some emulsifier other than Atlox 3409F. Presumably the task force figured a non-enchancing emulsifier would be readily available. Such was not the case, however. Consequently, two formulations were chosen: one, a formulation of fenitrothion in oil and Cyclosol 63 (going against the task force's recommendation), and the other a formulation of fenitrothion in Dowanol.

In the use of this latter formulation in New Brunswick in 1982, FPL violated the Federal Pest Control Products Act, which requires that pesticide labelling instructions be followed. Fenitrothion's label clearly states that it may be mixed in oil, or in water, with dowanol, or cyclosol, and with an emulsifier. But not in Dowanol alone as a diluent. Nevertheless you, the Pesticides Advisory Board, advised the

Minister of Environment to permit FPL to proceed with spraying fenitrothion in a Dowanol only formulation, and they sprayed it on 184,000 acres of New Brunswick woodlands near habitation.

In agreement with Dr. Spitzer's task force, we too would urge that the solvent Cyclosol 63 no longer be permitted in aerial spraying in New Brunswick. In 1978 the solvent Aerotex was removed from the spray program because of its aromatic hydrocarbon content. Aromatic hydrocarbons pose a known risk of cancer. Cyclosol 63 also contains aromatic hydrocarbons.

Armed with this knowledge, why did the Minister of the Environment of New Brunswick permit J. D. Irving Ltd. to spray fenitrothion in a formulation of Cyclosol 63 only, without any diluent oil or water contrary to the labelling instructions for fenitrothion? And why did FPL receive a permit to apply a formulation of fenitrothion in Cyclosol and oil to nearly 4 million acres of our province last spring?

As a result of the Task Force recommendation that water formulations are preferable to oil formulations, we assume that great efforts are being put into getting an approved substitute emulsifier to take the place of Atlox, which is a known virus enhancer. One candidate emulsifier appears to be Triton X-100, an emulsifier which was tested in a cell culture assay in 1978 (Rozee et al., 1978) and found not to enhance virus growth. However, this emulsifier has not, to our knowledge, been tested in live animals for virus enhancement; nor has it been tested in combination with any of the solvents used in spray formulations. And finally, it has not been tested when combined with an insecticide such as fenitrothion or aminocarb.

We should point out here that other Triton emulsifiers (Triton X-190 and Triton X-193) have been shown to be virus enhancing in cell cultures when combined with Cyclosol 63 or Dowanol (Weisner et al., 1979). This shows how essential it is to test any proposed emulsifier in combination with all other

components of the formulation it is proposed to be used in, before approving that emulsifier. As a further measure of health protection, if the cell culture enhancement ratio is 1.5 or greater, the emulsifier should then be subjected to in vivo (whole animal) testing.

IS THE BUDWORM SPRAY PROGRAM PROTECTING THE SPRUCE? In 1980, the New Brunswick Department of Natural Resources surveyed 4.0 million hectares of forest, composed of Crown, large freehold and small freehold lands. Trees were assessed to determine the extent of damage caused by the spruce budworm. Sprayed (the protection zone) and unsprayed (the set-back zone) areas were compared.

Results of the study did indicate that the balsam fir in the unsprayed areas had suffered twice the amount of budworm damage as those balsam fir in sprayed areas. This lead Clowater and Andrews (1981) to conclude that the budworm spray program is effective in protecting balsam fir. However, they found that the overall damage to spruce was much less than that of balsam fir and that the damage to spruce was approximately of the same magnitude when the sprayed and unsprayed areas were compared. This prompted Clowater and Andrews (1981) to state that:

a) the spruce budworm has caused significantly less mortality to spruce trees than to balsam fir, and
b) the spruce budworm protection program has had little effect in preventing spruce mortality in the protection zone.

As a result, the Concerned Parents Group recommends that areas composed primarily of spruce be deleted from future spray programs. In addition, the group recommends that in regard to reforestation projects, the more resistant spruce be planted rather than the more susceptible balsam fir.

DEFOLIATION COMPARISONS: An examination of Environment Canada statistics shows that defoliation in New Brunswick remains constantly high in spite of a thirty year old spray program whereas in Nova Scotia, without a chemical spray program, the rate has dropped dramatically in the last two years. Statistics from the Maritimes Forest Research Centre's Technical Notes No. 63 and 66 show that from 1981 to 1982, defoliation in Nova Scotia dropped from 700,000 to 212,000 hectares while in New Brunswick the area subjected to defoliation jumped marginally from 1,356,000 to 1,387,000 hectares.

The obvious conclusion must be that continued massive application of chemical insecticides serves to perpetuate the epidemic. What is needed is an alternative approach; one that will bridge the gap between a forest ravaged by budworm and saturated with chemicals to a forest with an unhealthy budworm population and where the ecological balance has been restored. The biological agent, BT (Bacillus Thuringiensis) provides such an alternative. BT is a bacteria which kills the larvae of members of the moth family, including the spruce budworm. Unlike chemical insecticides such as fenitrothion and matacil, it is specific to the moth family and does not harm those insects and birds which naturally prey upon the budworm (Smirnoff, 1978).

THE IMMEDIATE ALTERNATIVE, BT: In the past, when BT was recommended as an alternative to chemical sprays, forestry officials argued that BT was not as effective and was too expensive. However, BT has been proven to be effective.

After testing BT for its efficacy in 1979 (N.S. Dept. of Lands and Forests, 1980). Nova Scotia officials used BT in their 1980 and 1981 spray programs with generally acceptable results (Smith, 1980, 1981). In 1981, forestry officials in Quebec reported that the use of BT produced similar results to those of chemical treatments (Ministère de l'Energie et des Ressources,

1981). In Maine, after experimentation with different brands and varying concentrations of BT, success was realized and BT was even found to be effective in areas of high to very high budworm populations (Trial, 1981). Maine officials also concluded that large-scale BT applications were feasible (Dryer et al., 1980) and Quebec officials found that where two and sometimes three applications of chemical insecticides were necessary per year only one application of BT was needed (Ministère de l'Energie et des Ressources, 1981). This year in New Brunswick, after experimentation with BT, the Department of Natural Resources reported that two brands of BT provided the same level of protection as the chemical insecticide, fenitrothion (press release, October 19, 1982).

While BT has been proven to be effective, the problem of cost remains. In Nova Scotia, at present, the total cost of BT is $39. per hectare (Personal communications, from Tom Smith, December, 1982). This N.S. Dept. of Lands and Forests figure was derived using zero-based budgeting and includes everything from purchasing the formulations to worker accommodation to clerical work. Based on New Brunswick figures, the 1982 program cost $17 million with 1.6 million hectares chemically sprayed giving a figure of $10.50 per hectare. At first glance, one could assume that the cost of BT is almost four times that of chemical insecticides. However, in a proper comparison, a number of factors come into play, First, it is doubtful that the $17 million figure was derived using zero-based budgeting. Secondly, the Nova Scotia BT program is a small-scale operation with only 19,000 hectares sprayed in 1982. It is a logical assumption that the cost of a small-scale spray program per hectare would be greater than that of a large-scale operation and it is also highly probable that if New Brunswick was to purchase BT in large quantities, bulk purchasing would cause the cost per hectare to drop. These factors may explain why an official of the Department of Natural Resources

(personal communication, David McFarlane, October, 1982) quoted the cost of BT as being only twice that of chemical insecticides.

Not in the prepared text but a fact which is pertinent... Dr. Smirmoff of the Laurential Forestry Centre in Quebec quoted the price in 1980 as being just under $8. per hectare. Incidentally, Dr. Smirmoff has also suggested that one way of reducing BT's cost would be to set up a BT production plant in an economically depressed area of eastern Canada. The BT could feed on fish meal, jobs would be provided and the BT would even be exported to Central and South America where it is heavily used.

The Concerned Parents Group recommends that there be an immediate switch from the use of chemical insecticides to BT, and that BT be applied to only high value fir stands. Savings realized by thus implementing a more selective (biological) spray program would reduce or possibly negate the increased per hectare cost of using BT. Furthermore, the risk reduction to human and environmental health more than justifies any increases in cost should an increase be incurred.

LONG RANGE ALTERNATIVES: The Concerned Parents Group stresses that a switch to selective use of BT should represent only the first step in implementing a comprehensive Integrated Pest Management Program. Such a program would include improved silviculture, the planting of budworm-resistant species, gradual regeneration of natural predators as well as importation of natural predators such as wasp species, utilization of sex pheromones to control budworm outbreaks when the technology becomes available, etc...

THE 1982 CONIFER RELEASE PROGRAM: With regard to the continued use of the phenoxy - herbicides 2,4,5-T and 2,4-D, please consult the section on that subject beginning on page 21

of our Brief to the Select Committee on Environment. The concerns and data presented there remain current.

An article which appeared in the May 1982 edition of the British medical journal The Lancet indicates that international concern has not abated over the potential health hazards resulting from use of these chemicals. In the article entitled "Do Phenoxy Herbicides Cause Cancer in Man" authors Coggon and Acheson cite two Swedish case-control studies which provide "suggestive evidence" of an association between phenoxy-herbicide exposure and a specific type of cancer (soft tissue sarcoma). They also state the urgent need for further study in this area.

Last summer Concerned Parents Group communicated with the New Brunswick Department of Natural Resources, outlining several points pertinent to the herbicide issue. We had learned that the pre-mixed herbicide preparation used by C.N.R. contains an unknown emulsifier. In light of the very specific recommendations made by the Spitzer Task Force regarding the selection of emulsifiers to be utilized in the spruce budworm spray program (and their decision that Atlox 3409 should not be used), it should have been incumbent upon the department to determine what emulsifier was contained in the formulation.

Mr. Allen, then Natural Resources Minister, responsed in a letter dated August 31 that the nature of the formulation was a "trade secret" and further referred the matter to Mrs. Robertson, then Minister of Health. To the best of our knowledge, no further action was taken. Surely, if the government took its responsibilities seriously it would demand as a condition of purchase the disclosure of the components of any formulation under consideration.

Another point raised with Mr. Allen was the threat to families consuming game animals as part of their meat supplies when

studies in Oregon and Washington State have discovered the toxic chemical (TCDD) dioxin (contaminant of 2,4,5-T) in the tissue of deer and elk found near herbicide treated areas, (Kahle, 1980). Mr. Allen replied that animals avoid herbicide treated areas after spraying has occurred "because of the unpalatable nature of much of the vegetation". (No reference was provided for this or any other statements in the letter).

Mr. Allen should have consulted the guide to Chemical Weed Control issued by our own provincial Department of Agriculture. In a passage on "weed control in grass pastures" that manual directs:

> Keep livestock out of the field for 5 days after spraying to avoid chemical residues in the animals and animal products.
>
> Care should be taken to prevent grazing where poisonous plants may be made more attractive to livestock after treatment. It is a good practice to prevent grazing on the field for at least a week after spraying to reduce the chances of the livestock picking up harmful plants.

As early as 1950, C. J. Willard cited many reports of animals eating sprayed foliage of plants which are normally unpalatable to them. According to these early studies, animals seek out sprayed foliage because of a marked increase in sugar content that accompanies application of 2,4-D in some plants. As a result of herbicide spraying, animals thus may consume toxic quantities of certain plants that they would normally avoid (example: ragwort).

Willard (1950) also cites research showing that common weeds such as lambsquarters and pigweed treated with 2,4-D become extremely high in nitrates, which makes these weeds toxic to animals such as moose and deer (ruminants). This occurs because, in the first section of the animals' stomachs (rumen), nitrates are reduced to nitrites, which alter the capacity of the blood to carry oxygen.

The blood becomes brown instead of red, giving a grey-tan appearance to the mucus membranes of the nose and mouth. Unless treated promptly, death may come in a few hours or less. In Sweden, large numbers of reindeer from a foraging herd died due to herbicide poisoning after consuming herbicide treated foliage. Still others experienced abortions (Ofroth, 1977).

Horses in England became ill, and some died, after grazing on pastureland exposed to herbicide drift (Pinsent and Lane, 1970).

It is truly a marvellous and amazing phenomenon that the game animals of New Brunswick, unlike their wild and domesticated fellows from far and wide, have developed such discerning palates that they disdain munching on herbicide treated greenery. It's a fortunate thing for them, too, in light of Mr. Willards' revelations regarding the effect consumption of sprayed lambsquarters and pigweed has on less sophisticated deer and moose.

It should be noted that at no time has an environmental impact study been done on the use of herbicides in New Brunswick. On November 19, 1982, the Concerned Parents Group submitted a proposal for an environmental impact study to Ken Browne of Environment New Brunswick.

The group recommends that no herbicide spray applications be permitted in New Brunswick forests without first conducting such research.

REGULATIONS FOR GROUND APPLICATION OF PESTICIDES: Last summer, the Concerned Parents Group became aware of the fact that there are no regulations for the ground application of herbicides and insecticides except what appears on the label of the chemical container. These instructions relate to

formulation and container disposal but do not restrict where the chemical may or may not be used.

Although the Minister of the Environment spoke of detailed regulations for the aerial application of 2,4,5-T, it became apparent that he had no control over, or even necessary knowledge of, ground application of herbicides. No permits are required for such application even though thousands of acres may be involved.

One obvious concern is the runoff from sprayed areas into waterways.

The Concerned Parents Group recommends that the whole area of ground application of pesticides in both forestry and agriculture be examined with a view to stricter control, especially in the case of extremely toxic chemicals.

SUMMARY OF RECOMMENDATIONS:

1) That there be an immediate switch from the use of chemical insecticides to the bacterial agent BT, and that BT be applied to only high value balsam fir stands.

2) That BT should represent only the first step in implementing a comprehensive integrated pest management program which would include improved silviculture, the planting of budworm-resistant tree species, gradual regeneration of natural predators, importation of natural predators such as wasp species, utilization of sex pheromones, etc.

3) That if the New Brunswick government still insists on using chemical insecticides in the budworm spray program;
   a) the Federal Pest Control Products Act be adhered to,
   b) the use of Cyclosol 63 not be permitted,

c) any emulsifiers under consideration be first tested for virus enhancement while in combination with all other components of the proposed formulation.

4) In regard to the conifer release program, that no herbicide spray applications be permitted in New Brunswick forests until adequate environmental impact studies have been carried out on the herbicides in question.

5) That the whole area of ground application of pesticides in both forestry and agriculture be examined with a view to stricter control, especially in the case of extremely toxic chemicals.

At this point, I would appreciate the references being included in the proceedings.
Any questions?

MR. BROWNE: Thank you very much. I have a couple of questions just on points of clarification. One was with regards to defoliage comparisons. You had a table comparing New Brunswick with Nova Scotia. Nova Scotia including all of Nova Scotia including Cape Breton Island?

MRS. SHAW McKEE: Yes.

MR. BROWNE: Were there figures for the percent of defoliation with regards to the total viable forest that was surveyed? Do you have that information?

MRS. SHAW MCKEE: I have it in my briefcase; if I could just look at that technical note. I was under the impression that that was of the viable forest, the total percentage or the number of hectares. That's an absolute figure. The number of hectares...

MR. BROWNE: The figures were just of...

MRS. SHAW McKEE: From survey

MR. BROWNE: Of total defoliation from the two provinces but no other comparison of the total forest available. You have that, those figures?

MRS. SHAW McKEE: No, not in that technical no. But that would be a good point to determine the percentage. Yes. I suppose at this point we're showing the decline in defoliation which ... that point is important ... not actually the percentages that would be compared between the provinces.

MR. BROWNE: The reference from Swedish studies and there was a mention of two Swedish case control studies which provided suggestive evidence. Can you elaborate on suggestive evidence...

MRS. SHAW McKEE: I would like to elaborate on that ... the person who wrote that particular section is not here.

MR. BROWNE: Could that be made available to the Pesticides Advisory Board?

MRS. SHAW McKEE: I'll make sure that you get a copy of that. Suggestive evidence ... we know that it's not clear cut evidence ... it just shows that there is a need for research in that field.

MR. BROWNE: O.K. In the index study, it would also elaborate ... it says need for further studies in this area. Do they have some suggestions on what type of studies?

MRS. SHAW McKEE: Yes.

MR. BROWNE: One more and then I'll pass it on ... With regards to the chemical weed control, you mentioned that in some cases, 2,4-D make some poisonous species palatable where normally they would not be palatable. Did you run across any references where 2,4,5-T did the same? Or was it just 2,4-D that ...

MRS. SHAW McKEE: Again, the person who wrote that would be more able to answer it. I will take that as noticed and I will make sure that the information is sent along with the other paper on the Swedish Control Studies.

MR. BROWNE: Are there any more questions? Dr. Tooley ...

DR. TOOLEY: I'm not sure whether this is the same question as Ken Browne was asking you ... I have read the article in the Lancet by Acheson about the phenoxy herbicide and I want to have a look at it again. I just wondered if you got the reference under your thumb there.

MRS. SHAW McKEE: The references are in the back of this brief. O.K?

MR. BROWNE: Are there no other questions? Thank you very much. I'd like to call on the next presentor, from the New Brunswick Forest Products Commission.

J. IAN MacDONALD: (Registered Professional Forester) I'm the secretary to the New Brunswick Forest Products Commission. This is a brief to the Pesticides Advisory Board by the New Brunswick Forest Products Commission. Mr. Chairman ... I have to apologize for not having these

remarks typed out. I will do this though when I return to my office and send them to you.

The New Brunswick Forest Products Commission appreciates the opportunity again to present a short Brief to the New Brunswick Pesticides Advisory Board at this fifth series of Public Hearings.

As you know, the Commission has an independent Chairman, two representatives from wood producers, two from wood processors, one from Agriculture and Rural Development and one from Natural Resources. This Commission again completely supports your Board's decisions particularly those decisions relative to aerial spraying protection for all forest lands.

Adverse decisions in this regard have been causing disastrous effects on woodlots owned by 40,000 citizens. Every person in the Province has been affected adversely by the decision not to protect the 4,000,000 acres of private woodlots.

One fifth of one percent of all forest lands owned by individual citizens of the Province of New Brunswick were protected satisfactorily in 1980. And this was the first time in four years that any forest land owned by individual citizens, private woodlot owners, was satisfactorily protected. In 1981 and 1982 only minimal increases were noted so that for six years well over 90% of the 4,000,000 acres of forest land owned by approximately 40,000 citizens has received no protection from the budworm plague.

This Commission urges the protection of the remaining merchantable spruce trees as well as the young growth of balsam fir and spruce trees in private woodlot forests as well as Crown and large freehold forests in 1983.

The disastrous effects of not protecting our forests from the budworm will have a traumatic effect on many lives because of the danger of being hungry, unemployed and faced with an extreme forest fire hazard. The Commission again states that the postulated health hazards for instance resulting from using pesticides according to your Board's decisions and guidelines on our forests would in comparison be insignificant.

The protection of private woodlots is too long overdue and you can rely on this Commission to support your decisions.

I will also send you an up-dated list of the addresses, etc. of the Commisssion.

Thank you again for the opportunity to express these concerns and state that the Commission's position during these five hearings remains the same.

MR. BROWNE: Thank you very much! I think I should again iterate that we are an advisory board, the Pesticides Advisory Board and we are advisors to the Minister of the Environment and it is the Minister of the Environment who issues permits for any applications of pesticides in New Brunswick. Are there any questions from members of the Board? Would you be prepared to answer any questions from the floor? Is there any questions from the floor? If not, thank you very much. The next presentor on the agenda is from the Conservation Council of New Brunswick.

HAJO VERSTEEG: Mr. Chairman, members of the Board ... My name is Hajo Versteeg. I'm the vice-president on the Conservation Council of New Brunswick. Dr. Lucy Dyer who is the president and I will be giving split representations with respect to the position of the Conservation Council as it applies to pesticides and more particularly with

respect to the budworm spray program. Dr. Dyer will be speaking briefly about alternatives to the use of pesticides again particularly as they relate to the budworm spray program. We would like to begin by commending the Ministry of the Environment in no uncertain terms for the very recent amendments to the Pesticides Control Act. Incidentally, does the Board have our brief? Did we get a copy of that to the Board? I believe that Mr. Shanks had taken a copy from us and he's making Xeroxes for you. It's fairly detailed and I believe that Greg Shanks has a copy and will make them available to you. It is fairly detailed and I don't intend to go over now and I'm certain you will give it the time that we think it deserves in any case. I would like to again say that we are very pleased with the amendments to the Pesticides Control Act, particularly the substantial increased fine provisions and the fact that the Crown is now bound by all provisions of the legislation. I would however like to reiterate the concern of the Concerned Parents with respect to the exemption as it applies to the non-aerial application of certain types of pesticides. I appreciate that perhaps with respect to agricultural chemicals it might be difficult to work out some detailed type of permit process. Surely for the forest operations, they should be bound by the permit process. If nothing else, it allows the Minister of the Environment the ability to at least know what's going on. As it is now, at this point, the Ministry cannot for example tell us just how much of what was sprayed where, if it was done without the permit. So we would strongly urge that that somehow be amended. If I could, I'd like to now talk again briefly about risk assessment. I had some prepared notes but I don't think that it's worth using them at this point. Suffices it to say that at least in my estimation, the process of responding to the concerns with the budworm have been almost exclusively centered around legal concepts of burden, of harm, proof of harm, and proof of causation. We had an example last year just

about this time when the doctors in Halifax, Rosee and Crocker, suggested that there was a potential causal link. I don't think they ever said that they conclusively established a causal link, they said there was a potential causal link between certain emulsifiers and Reyes syndrome. The response by what I call the decision makers, and the decision makers is really anyone that can exert influence on environmental issues, that would certainly include a board such as yours, but in this case it was Mr. Bird who was then Minister of Natural Resources and he stated that he would unequivocally stop the spray program but only if the anti-spray people could prove that it was harmful. I think he used the term: "If they can conclusively prove harm, we would stop the spray program." In addition, there were representations made continually by various pro-spray interests at the Environmental Board hearings to the effect that unless absolute conclusive proof of harm was established, the spray should be continued. So that essentially has been the way the budworm program has been managed to date and the Conservation Council is strongly of the opinion that to use those traditional proof of harm and proof of causation principles when managing the program will ensure tnat every time we make a management decision we're going to be wrong in that decision. And the reason is because we're not dealing with a (tape inaudible). Usually when you're talking about such thing as a tort law or a criminal law and you're trying to assess a problem, you have all the information available to you that you need at the time to make the decision, so that a person that's confronted with the problem can say here it is, here is the information, you take what you want from it and then you make a ruling. When you're dealing with a risk activity, with an environmental risk activity, and I don't think that anybody is going to argue that the budworm program is not a risk activity. By definition, it's characterized by a lack of information. We simply don't know today whether it's going to be harmful and it's going to take perhaps twenty, perhaps thirty years in

order for us to find out. But of course, by that point in time, it will be too late. We simply will have conducted our activities as if there was no urgency in trying to rationally manage the problem. And then when we find out twenty, thirty years down the road that yes indeed, some of these chemicals we've been using are in fact carcinogenic, mutagenic, teratagenic, it doesn't matter what, by that point and time, it will be too late. Now, as the appendix to our brief, an article I wrote about the last summer spray program indicates, the utilisation of an environmental risk assessment technique will not ensure that every time we make a choice about an environmental risk activity it will be harmless, that it will be safe. That's not the aim of the game. The idea is to try and rationally manage the risk activity so that we minimize the potential for error. And we feel that is exactly what is not being done and the reason it's not being done is because the decision maker will rely on those old traditional rules. And those rules say that until you can prove that it's harmful, until you can prove to me that what I'm doing is harmful, I'm going to assume that it's safe and then attach very minor conditions on to it. An when you do that, because you can't prove until it's too late when you're dealing with a risk activity, you're going to get into difficulties. So, the Conservation Council would suggest as an alternative that we get involved in some very detailed, very admittedly costly but alternately very worthwhile risk assessment rational management of the budworm spray program. Now, I was talking to Dr. Dyer on the way up and she said, "Suppose you were in the position of making the decision with respect to what we'll do in next summer's program? You've got four months in which to gather information and then make the decision, what would you do?" And my immediate response was to say, "well, absolutely no chemical spraying. We absolutely ban the use of chemical spraying." And then I held back a little bit and said "Well, perhaps that's not fair. It's not exactly the type of approach we'd like to take because, just as the risk assessment technique will say that we're going to have to

incorporate all things, because the Conservation Council would certainly appreciate the value of the forest. I don't think anybody is going to argue that the goal is the same, the protection of the forest, and the concern is with how we're going to do it. So that, if I was put on the spot, I would like to say as an absolute bare minimum, that we have a very detailed setbacks zone. Not a thousand feet as we've had for the last couple of years. That seems to me, that when you're dealing with chemical substances, where we just don't know, they might be safe, it might turn out that twenty years down the road, they are considered safe. But by the same token, they might not be. They might be very dangerous chemicals and that when we say that we're going to play this game of proof of harm, and proof of causation, then we're playing with dynamite. So at the very least, it would seem to me that we establish very substantial setbacks. And then, for a certain zone even beyond those setbacks, we get into some very detailed use of the alternatives to the spray, the synthetic spray of the fenitrothion with the oils or certain types of emulsifiers. And only in very remote areas, where we have definite indication of infestation, that at that point if we feel that we have to, then we use the chemicals. Now, again, that would be for next year's program and I would suggest that, if I were the one making decisions, I would immediately try to establish an independent, multi-disciplinary board which would analyse every aspect of the spray program. It's been going on for approximately thirty years and we have not yet had a detailed economic analysis of the program. That would seem to me to be fundamental. It's only now that we're with the various task forces, looking at the health effects. That would again seem to me to be fundamental. We have to look at the social impacts. We should also consider environmental impacts other than strictly human health impacts, because our concern is also with the ecosystem as a whole, as opposed to simply the human element of it. I don't think that I would like to add anything further on that. I would suggest as a final summation

that the use of risk assessment techniques will ensure that the most appropriate response to the budworm program and to the pesticide issue in general, in that the process that we have historically taken to date, is going to lead unfortunately into very grave difficulties. Are there any questions?

MR. BROWNE: Are there any questions from members of the Board?

MR. VERSTEEG: Surely someone has a question, from the audience ...

MR. BROWNE: I find your position with regards to proof of safety as opposed to proof of harm very interesting. In your experience, do we treat other chemicals or foods or pharmaceuticals from that position as opposed to proof of harm or would this be something new?

MR. VERSTEEG: The approach that I'm suggesting is relatively new in Canada. It's starting to get used in the United States. We can look at some of the legislation that they're dealing with in the United States. But, by and large, it's untried in Canada. Now, I say that with a qualifier, for example, the federal Pest Control Products Act deals a lot with threshold limits. And some people would argue that a threshold limit is one that incorporates this risk assessment. But what tends to happen is that we establish a threshold limit and then the momentum picks it up and the underlying implicit indication is that anything below the threshold is safe and anything above the threshold is dangerous. So as long as we comply with the threshold, we're O.K. But if you go back a step, and you look at how they establish the thresholds, then you start getting into that difficulty and you start saying, "well maybe it's not actually risk assessment, that at best they've

conducted a guesstimate of what the threshold is and hope in effect that it's going to be a situation where less than is O.K. and more than is not O.K." Now, there is a fair bit of scientific writing now suggesting that there is no such thing as a threshold. If you're dealing with a product which is a carcinogen, then a single instance of affliction on a single cell would be enough to start the cancer process. And that's why, we have something like a latency period. Why it sometimes takes twenty, thirty, forty years, from the time of initial exposure, and it might only be one exposure. From the time of initial exposure to the diagnosis of the tumor, it might take twenty, thirty, forty years because it has taken that long to develop. So that, I think that a complete risk assessment process has yet to be conducted in Canada with respect to the use of pesticides. So I can't give you a good example in the Canadian context of where it has been used. I'd like to be able to. Maybe we should be the first.

KEN BROWNE: With the thought of proof of safety, you would then at sometime be able to after whatever tests are conducted, say that a particular chemical was safe to use. Would you therefore say that that would end the studies, or end any more research into those areas?

MR. VERSTEEG: That's an excellent question Mr. Browne. The state of the art, as we know it now, is not in a position to be able to say that with respect to most chemicals that are suspect, I mean ... to ... you've got to be dealing with the chemical which is feasibly possible it has some type of potential harm. It doesn't matter if it's carcinogenic or mutagenic, doesn't matter. But obviously, when you're looking at pesticide, you're looking at them to use them for a reason and it's usually to kill something. So, right away, most of those chemicals are suspect. Now, there's a lot of discussions particularly among lay people that say if you feed enough of a substance to something,

it's going to cause cancer sooner or later. That's simply not acceptable in the scientific community, that's for sure. A substance is either carcinogenic or it's not. Now the problem is that if you use animal biopsies, for example, you use animal studies, that's about the only thing that we can do that gives us some indicator. Again, we're getting into that whole realm or incertainty. But animal studies gives us some indicator or the potential carcinogenic effect, as it will affect human beings. The problem is that, in an animal study, if you feed your animals a chemical, the fact that they don't develop cancer does not tell us that substance is not carcinogenic, unfortunately, because it might be a "built-in" error simply because of the cost involved and the time element involved, it can't detect all the cancers. They say that for a proper animal cancer study, with something like a 5% margin of error, you need something like six or seven hundred animals. And that would be prohibitively expensive over a two-year period. What we usually do is groups of fifty animals and that costs in the nature of a quarter of a million to half a million dollars, just for those fifty animals, and the margin of error is upwards of around 10% or 15%. So you'll even miss those carcinogens after having conducted those tests. So, again to answer that question, unfortunately, at this point and time, we can't rely on scientific information to give us the answer in the foreseeable future. So we can't say, "well let's wait." You people as decision makers are stuck. You cannot say let's wait until we get the answer, you can't take the chance because on the one hand you've got people pressuring you to conduct the spray program, on the other hand you've got people like myself saying, "take a step back." You've to to make a decision. And I appreciate that, in an advisory capacity, I still think it's a very important one. What the Conservation Council is saying, you have to know what you know and what you don't know. And you have to incorporate both elements

into a response, and if you can do that, and if you can do that in a rational manner, then you have in effect, thrown out those burden of proof rules. You can't prove the harm at this stage. We can't do it. So that everytime someone suggests "prove to me it's harmful and I'll stop," I'll say you're in the wrong ball park. We can't do it. Or they're very shrewd and they know darn well that we can't do it and say well we'll continue spraying until you can prove it. We can't do it one way or the other. And we can't say, "let's wait a year or two, and maybe the scientific information will be available". Maybe it will, but more than likely it won't.

MR. BROWNE: Any further questions? Thank you very much.

DR. LUCY DYER: I'm Dr. Lucy Dyer. I'm president of Conservation Council and I would like to just speak briefly to another section of our brief, which is on the alternatives to the present use of pesticides. In the spruce budworm program, there are some alternatives available at the present time and there is another one, pheremones which has the potential of being by far the safest alternative. The pheremones are non-toxic and act only by modifying the behaviour of the budworm rather than by killing them. Recent experiments in both the field and in the lab have shown that they can be very effective in reducing matings. Reduction as high as 99% have been achieved at high population levels. This summer, Dr. Seabrook at the University of New Brunswick has shown that levels as low as 2 nanograms per cubic metre can give very effective control and that is less than 10^{-9} grams and a gram is already very small. So there is now no doubt that the mating behavior of spruce budworm can be profoundly disrupted by pheremones and we strongly recommend that their development should be pursued as a very high

priority of the government so that they can be used to fight spruce budworm as soon as possible. They have the possibility not only of supressing epidemics which the chemicals cannot do, but also of preventing outbreaks of epidemic as well when the populations are low because they are just as effective at low populations as they are at high. However, we do realize that they are not operational at the present time and that there is some control needed. We recommend that an integrated pest management program be instituted based on the future use of pheremones but present use of Bt as the main component and other biological controls combined with better forest management and silviculture as an alternative to continued spraying of biocides. Bt has recently also had some successes. The report to the 1981 cooperative B.C. spray trials have concluded that it is now as effective as chemical pesticides and that it should be widely used especially in environmentally sensitive forest areas. It has been tried in New Brunswick in the past and with very spotty results. But it appears from the results found in this report that the reason is that they were simply not using effective concentrations. By increasing the concentration by about a half as much again, it is as effective as the chemicals. It also appears to have an advantage over conventional chemical pesticides in that that it can provide better protection for spruce forest than do the chemicals. There was a report published by the Department of Natural Resources assessing damage caused by the budworm on spruce and balsam fir in New Brunswick and they found that the damage to spruce was approximately at the same amount in protected and unprotected zones which would indicate that the conventional program has basically been ineffective in protecting spruce trees. The trials with Bt indicate that Bt is effective in protecting spruce. So it appears that it may be even more effective than a biocide in some cases, and we recommend that Bt replace the use of fenitrothion or other chemicals whenever there is any possibility that people could

be exposed to the spray directly or through drift. For many years, we have been saying that improved forest management and silviculture could reduce the problem simply by reducing the susceptibility of our forests. And again, there is a section on this brief summarizing that position. By using genetically superior strains of trees, mixing species, thinning, fertilizing, and generally taking better care of the forest, one can achieve savings in harvesting and improvements in yield anywhere from two to eight times, that of the uncultivated forests. And this would be well worth doing. In addition, Maine has had success in the past few years in reducing the amount of pesticides they have use by 40% and still maintaining the same protection. And they've done this by a very simple means. They've just had better mapping and better defining of the areas that need protection. So while it's true that it is more difficult to spray small defined areas, the savings in pesticide, particularly if the more expensive Bt is being used, would justify the extra effort. And we strongly recommend that the Province immediately adopt practice of more accurately defining the boundaries of susceptible areas and confine the protection zone to those smaller areas which would benefit the most. Finally, in addition, there is a section in the brief, which promotes the idea that the Province should take a much broader look at the cost and benefits of the spruce budworm spray program and forest management in general. Unemployment is a major problem in the Province at the present time and is a real social problem. The costs in term of unemployment insurance benefits and welfare are very high and the human costs for those who are unemployed and have no hope of finding a job are also extremely high. At the same time, the forest industry has been becoming increasingly mechanized and has been reducing jobs, and we feel that the cost benefit analysis which we have recommended should include an overall look at the total social

cost of unemployment and mechanization and that there are areas where herbicides are being used now, where this work could be done manually and where the overall cost of the province as a whole would not be affected. While it is true that it would not be wise to decrease the competitive stand of the forest industry at the present time by raising their prices, I would think that the Province as a whole would find that it was to their benefit to subsidize the increased use of employment of people in the forest industry as opposed to mechanisation, herbicides and other trends which tend to reduce the amount of employment. Finally, we would like to commend the task force recommendations of the Spitzer task force and hope that they will be followed. In particular, the unequivocal recommendation that solvents containing fractions of fossil fuel oil which in turn contain large amount of polycyclic hydrocarbons should not be sprayed into the environment. We support this and urge that the recommendation be enforced, not only in set-back zones but over the whole of the Province beginning this year. We're also pleased to see that there's been a task force established to study the incidence of cancer in this Province and we hope that similar studies will be implemented in other areas where there could well be problems arising from the spray program. And, we also support the discontinuance of the use of Atlox in the budworm spray program and feel that the government should continue to follow the guidelines of the task force and particularly in not approving the use of any emulsifier or additive in any aerial spray program if the formulation contains any component of unknown or unprooved safety. So that basically summarizes the rest of this brief.

MR. BROWNE: Are there any questions from the Board? Dr. Devadason ...

DR. DEVADASON: I just wanted to make a comment in regard to the task force that you referred to. There is indeed a task force studying cancer, but the Minister of Health, you may recall, indeed announced two task forces: One to study the cancer in New Brunswick and the other to study birth defects in the Province. So in fact, two separate task forces have been set in place.

DR. DYER: I believe that's a very positive move.

MR. BRONWE: Any further questions? Thank you very much! I'd like to call on the next presentor, from New Brunswick International Paper Ltd.

BLAIR HODGSON: I don't know how you other fellows felt about getting up here but it's a little shaky. Gentlemen, I'm going to read from my text. My name is Blair Hodgson. I work for New Brunswick International NBIP Ltd. and I have with me Carl Heinstein who is our Project Forester looking after our private lands.

Back in 1952, as a student I was fortunate to work for Dr. Frank Webb, and Bev. MacDougall and to me particularly, Fred Farrell, then Woodlands Manager of the New Brunswick International Paper Co. Under Bev, I helped put the finishing touches to the budworm city aristrip.

And to us in those days, forest management was a vision. It was a dream that had some substance, protecting our forest, one of the keys to good forest management, became a reality at that time.

The spruce budworm outbreak was first observed on our license in 1950 and was classed as moderate. In 1951, it was classed as heavy and 1952 was very heavy. That year, we lost nearly

100% of the current years foliage. During 1952, NBIP established a 44 square mile check area on our limit of which the core containing some 33 square miles was never sprayed. Cruise data from 1948 and 1952 indicated an average volume of 18-20 cords per acre inside this 33 square mile check area. And, four years later, in 1956, this area was recruised before a major salvage operation took place and this same wood cruised out at 5 cords per acre. Now, we have that documented. Most of this wood was lost to budworm and fungi, and we found it very heavy as a price for knowing what happens when you don't protect our forests.

During the oubreak of 1952-1957, had the Province not decided to protect our forest, New Brunswick might have experienced the Charlo Check Area disaster then as Cape Breton is experiencing it now.

In 1982, NBIP signed its first pledge to the citizens of New Brunswick assuring this Province that it will responsibly manage the forests. As one partner accountable to the Crown, NBIP is following a common set of forest management rules and techniques, planning not only for today, but for the next 25 years.

In basic terms, we've become farmers. We must tend our crops. As tree farmers, we know that a portion of our forest land will not naturally return to a forest of valuable tree species after cutting and we must help to replant these areas. In 1982, NBIP planted 3,200,000 seedlings on crown lands and 2,000,000 on its own land. That's over 5,000,000 trees per year.

It makes us feel good that we are able to participate with the Department of Natural Resources in giving something as valuable as this back to the soil. It secures our future, it secures the future for our 1,500 employees, and it helps secure

the future of the 45,000 New Brunswickers employed in forestry-related operations.

The amount of wood that we can harvest from our license each year has been carefully calculated using data from forest inventories. This annual allowable cut upon which our mill depends in great part for its raw materials can be maintained only if the forests are protected against fire, insects and diseases. Silvicultural treatments are needed like stand tending, site prep, tree planting to maintain the productivity of the forest. Nature alone cannot, over the long term, produce the kind of forest which will grow trees and ultimately fibre to keep our mill operating.

Too few people really understand our wood supply situation in New Brunswick. We now have an over-supply of our two quality softwood species: spruce and fir. Provincially, our spruce and fir is over-mature and not very healthy. We have more ripe wood now than we can use each year and we have to make it last for the next 40 years. We have very little 30-50 year old spruce and fir coming of age. We have to protect this mature forest or we're going to get a stock break by the year 2000. Pulp and sawmills could close during the period 2000 to 2020, if we don't protect this mature forest. Our provincial shortage will be determined by how well we keep our present forest alive. Planting now, will only produce a mature tree in 40-50 years, so we can't depend on this long term effort to help us through this critical period. Protection and harvesting in the right places are the only tools that can stretch our wood supply during this period 2000 to 2020. The budworm spray program is designed to do just that; to keep these mature trees alive until the budworm epidemic again collapses as it did in 1957.

Forty years from now, plantations are estimated to yield 3 times

the volume per acre as our present forest, and will represent about 30% of the forest.

This represents a significant investment in hope, in effort and in money to all New Brunswickers. As farmers, we must protect this investment. Herbicides, the other important pesticide in forest management, are needed as most cut-overs and plantations have an overabundance of undesirable or less useful species such as pin cherry, rasberries, birches, aspen, and they become quickly established after logging. These weed species grow faster than the valued spruce, fir and pines. Weed species suppress, choke out and eventually kill planted seedlings. Herbicides applied in the early fall will control the weed species without harming the planted conifers.

Our professional foresters, now with special training in vegetation management with herbicides, are expected to supervise spray operations which can only be started after a permit from the Minister of Environment has been obtained. This permit spells out the conditions under which spraying can take place. For the last two years, our spray operations were monitored by representatives from the Department of the Environment in the field. During the operation, we take all the necessary precautions to insure that only the target areas are sprayed and that the people who mix and handle the herbicides wear approved protective clothing. We make certain that no one is in the spray area during spraying and for 24 hours after spray application. We also make certain that the empty pesticide containers are crushed and disposed of according to regulation.

We have obtained good release of planted conifers following herbicide application and our plantations so treated show marked increased growth.

Within the 5 mile buffer zone, we have used manual methods to control weed species in plantations. Using lopping shears,

we have cleaned close to 1000 acres of plantations, partly under a cost sharing agreement with the Federal and Provincial Governments. This method of clipping brush around planted seedlings gives often only temporary relief from competing vegetation. Suckering of the unwanted tree species starts succoring soon after. And this technique is from 400% to 700% more expensive than chemical herbicides. It's costly and it's an unreliable alternative.

The phenoxy herbicides have been used for 30 years or more, and they have been widely studied and investigated. The majority of investigation of 2,4,5-T, in relation to human health hazards, have shown that this chemical is safe when applied as prescribed by the manufacturer and at recommended rates. It poses no threat to the environment. For this reason, and because the phenoxy herbicides are the only effective herbicides registered for forestry in New Brunswick, we ask the Pesticide Control Board to recommend the use of these herbicides again in 1983.

We would also like to see the use of currently registered herbicides by aircraft be extended to areas within 3 miles and possibly 1 mile from occupied habitations. The distance of 1 mile from habitation provides the same set back area as used during spraying with insecticides. Aerial application of herbicides (top kill of potatoes, for example) is permitted even closer.

I would like to point out that the herbicides used in forestry in Canada represents, as we understand, about ½% or 1% of the agricultural use and unlike agriculture, we normally need to apply one application over a 40 year span and then only to a small portion of the total forest.

In conclusion, we would like to emphasize again that pesticides and in particular herbicides are very important in forest

management. As Dr. Baskerville, Dean of Forestry at UNB, stated "the delay of 10 years in availability of wood from plantations, such as might occur from a ban of herbicides, would force the reduction of industrial consumption to about one half of its current level." It requires no great imagination to consider what this would mean to the forest industry of New Brunswick. Our company recognizes the need for intensive forest management in New Brunswick. We strongly support the prudent use of pesticides as one tool to develop and maintain a healthy provincial forest. Thank you.

MR. BROWNE: Thank you very much. Are there any questions from members of the Board? I would like to ask about one of the statements you made here that you only need to apply the herbicide once in forty years to keep a plantation clear?

MR. HODGSON: That's what we would hope for. That's a normal rule, one time through its life. Our experience so far has indicated one application should do it. What it really does is that it gives the soft wood a chance to get going, it gives them a fair shot at living.

BOARD MEMBER: But we're talking a newly planted tree that's maybe this tall?

MR. HODGSON: Every plantation will have its own treatment if you like. You may in fact not have very much competition at that age, the height that you're indicating. The fact that the weeds species so called or the species of lesser value, sometimes don't really get going and it may take three years. Depends whether we're talking about a rasberry problem or whether we're talking about a pin cherry problem; depends on the site. As I say, each plantation really has its own treatment. It could be year two, it could be before

planting, it could be year five or seven but usually one would take us through. That has been our experience so far.

MR. GORDON: Is it feasible to keep mature and over-mature trees alive for the next 30 or 40 years using chemical sprays? Would they not fall down by natural decay and such processes?

MR. HODGSON: We think that we will be able to get it all of this mature. Mind you, some of the wood that is now over-mature may not be available to us. Some of it may fall down. It's difficult to really properly answer that question but I think one of the things that is interesting in the approach that the Department of Natural Resources is taking in the future cutting plans is that they are insisting that the cut-overs, and I'm getting away from your concerns but it sorts of ties together, that the cutting areas max size for a clear cut would be 125 hectares, roughly 300 acres. Then you have a 500 meters band of untouched trees if you like before you can have another cut-over. This is going to tend to make all the companies spread their operation over greater distance. I would suspect that we'll be able to catch most of the mature trees because of this system that is being required of us. What I'm trying to say, the old days it used to start here and you just keep on cutting until you finish this piece of forest. You can't do that anymore.

MR. BROWNE: Any further questions? Dr. Tooley ...

DR. TOOLEY: You referred to the manual clearing of weeds from a thousand acres. This was in one year, was it?

MR. HODGSON: No, it wasn't ... There was spraying all around, I believe three years.

DR. TOOLEY: Can you tell us how many people were involved and how long it took?

MR. HODGSON: Can I get Carl to mention some of the specifics?

CARL HEINSTEIN: It just roughly involved fifteen, twenty people a year for about three years.

DR. TOOLEY: Thanks.

MR. BROWNE: All right? Thank you very much! Time permitting ...

FLOOR: Are you allowing questions from the floor?

MR. BROWNE: Mr. Hodgson, could you entertain a question from the floor?

MR. HODGSON: Well, my presentation was for the Pesticides Advisory Board.

MR. BROWNE: Fine, Thank you! Next presentor, from Fraser Incorporated ...

LARRY FYFE: Good evening gentlemen. My name is Larry Fyfe and I am with Fraser Inc. forest-based industry in northwest New Brunswick. First, let me thank you for giving us the opportunity to present our views on a rather controversial subject. There will be copies, I gather, for all members. No presentation is ever completely satisfactory to its author and this one is no different. The thoughts and ideas keep cropping up after hours and days after you've put on the last punctuation mark in the document and as I listen here tonight, ideas and facts and so on so forth kept forging

through, so that I could in all practicality write another ten or twelve page document but, I doubt if we'd have time for that. One will suffice, I'm sure. But let's say simply that this documentation does not contain all research or surveys or what have you; I make no pretentions to being a professional forester or medicinal person or anything of this nature. This is basically an appeal to reason and common sense, I think.

Fraser Inc. is a forest-based industry which originated in New Brunswick in 1877. From a sawmill concern, it became an integrated forest product company with the construction of pulp mills and paper mills which followed the saw mills. In New Brunswick we operate two sawmills with a total capacity cf approximately 90 million BDF per year. We operate a sulphite mill in Atholville which is presently being modernized at a cost of $180 million. This mill when modernized will be a highly efficient operation, being over 80% energy self-sufficient. Our other New Brunswick operations are located in Edmundston where we operate a sulphite mill, a groundwood mill and a boxboard mill as a complex. The mill was modernized between 1976 and 1979 at a cost of $90 million. We are presently in an energy reduction program that will ultimately make the Edmundston-Madawaska complex over 75% energy self-sufficient. That program will cost a little over $50 million.

I have enumerated these projects, gentlemen, to indicate to you the degree of commitment this company has made towards New Brunswick. In the past 10 years, we have invested over $300 million to ensure our survival and our growth in this Province.

We are not the only corporation to go this route, N.B.I.P. at Dalhousie, Consolidated-Bathurst in Bathurst, Boise in Newcastle,

Irving at Saint John, all have invested heavily in this industry, in this Province.

And all this confidence in the future of New Brunswick, all these investments in the future of the industry, all the jobs that the industry creates in New Brunswick - 16,000 direct jobs and 15,000 to 20,000 indirect jobs - all depend on one single factor, a reliable source of raw materials. In this case, spruce, fir and some hardwood.

Let us examine together, if you will, the reliability of this resource. For the past several years our department of Natural Resources in Fredericton has carried out intensive studies of our forest resource, particularly our crown land forest resource, which occupies 44% of the area of our Province. And these studies have led to a new Crown Lands and Forests Act. The provincial crown lands were allocated to ten major forest industries for management and wood supply and incorporated in the re-allocation was the guarantee of softwood supply to about 100 smaller industries. The basis for this allocation was the capacity of the licensees and sublicensees, in the year of highest use between 1974 and 1978, after subtracting the volumes each can obtain from his own land; from the small woodlots of the Province; and from neighboring provinces and the State of Maine. Now, the interesting point of this exercise, and one that is of vital interest and should be a vital interest to all, is that the residual demand on crown forest so established, exceeds the substainable supply or the allowable annual cut, if you will, from that forest in its present stage by over 25%. Therefore, each and everyone of the ten major users, including Fraser, must settle for 25% less wood from crown land that their demand would indicate at full capacity. Not the sublicensees, they were guaranteed their quota. Therefore, already the ten major companies will have to look out of Province in order to

meet their requirements when operating at capacity. This erodes the reliability factor to some degrees, you can well understand. As well, in order to maintain even this reduced level, certain "rules" have been built into the supply analysis which must be rigidly observed if we are to survive.

The first rule is to harvest "oldest first". To stretch the supply of wood, it is essential to first harvest those forest stands whose growth has stopped, or is negative, and ensure that those stands are replaced by crops which are potentially equal to or better than those harvested.

The second rule is that the existing forest must be stretched for 40 years. We find ourselves in the situation where the age class distribution in our forest is out of balance. It is essential therefore that a combination of the present mature and overmature forest, and the present young forest be stretched for a 40-year period. Bear in mind that every tree which will be harvested in the next 40 years is out there growing right now and every opportunity must be taken to protect, to improve the condition of, and to speed up the growth on the young stands that will be used in the period 20 to 40 years from now.

And the third rule is that plantations must be cultivated. The early years in the life of a softwood tree is a period of intense competition. It is obvious that control of competition is as essential to growing a crop of trees as it is to any other crop, and is an important part of crop management. Before a plantation can be included in your wood supply survey, it must be recognized as established and free to grow. Established meaning that the seedlings have taken root and are sufficient in number per acre, while free to grow means that the seedling is taller or equal in height at least to the surrounding competition.

The most practical and economic method of cultivation to reduce competition is by the application of herbicides in the early stages of plantation development. Normally, two applications of herbicide applied in the first seven years of the life of a plantation is sufficient to overcome early competition.

Our projections of wood supply are based on carrying out the cultivation or stand tending treatments, which will result in stands that are ready for harvest in 40 to 50 years and yield a volume of some 30 cunits per acre compared to natural regeneration in 70 to 80 years with a 20 cunits per acre yield. If these treatments are not carried out, then we must look forward to a period of reduced supply because our present forest can be stretched only so far.

The fourth rule is protection of the crop. A large investment of labor and money in a crop is pointless if that crop cannot be protected. Protection is an integral part of crop management. In the forest, there are two major protection aspects - fire and insects. We are steadily improving our early warning systems, our get-away time, and our techniques for fighting fire. Compared to some provinces, relatively speaking, our fire prevention and fire fighting have been rather successful. The spruce budworm is our greatest insect enemy and our strongest competition for the species of trees which are the lifeblood of this Province's forest economy. Protection from the spruce budworm is a quite different proposition than protection from fires. We're dealing with an insect population that, with relatively few survivors each year, can guarantee an infestation the following year. And if we were only interested in causing a collapse of the budworm population, and not vitally interested in stretching our forest raw material supply, we would do nothing. This management option would, in a very few years, result in a simultaneous collapse of both the insect population and the forest; we,

therefore, must carry out an annual spraying program to keep as many trees alive as possible until they can be used. If these four rules are not followed, the reliability factor of our raw material supply will again suffer additional erosion.

Because of present forest management plans brought forth through the requirements of the new Crown Lands and Forest Act, we at Fraser have plans and are:

a) harvesting the oldest - that is stretching the wood supply those 40 years;
b) planting at an accelerated rate to establish plantations that will be ready in 40 to 50 years time (last year we planted over 6 million seedlings);
c) cultivating these plantations through herbicidal treatment of competing species in the early stages, fertilizing and thinning or spacing in the stagnating periods;
d) and we do support spraying to reduce budworm damage thereby extending the life of our standing forest and protecting our plantations.

All are included in our forest management plan, because they are management tools without which we cannot do the job, without them we will fail in our efforts to provide a reliable supply of raw materials to industry which is the mandate that the new Crown Lands and Forests Act has given the ten licensees.

We know what the consequences are of doing nothing. Some private woodlot owners can tell you of the losses that they have sustained due to no spray policy beyond certain limits and on private woodlots.

And I would like to quote from a letter which appeared in the Telegraph on August 27, 1982. The letter was written by Mr. Marven Sellick of Jemseg, Young's Cove Road. And it was adressed to the editor and I quote:

"Dear Sir:

Three cheers for the Concerned Parents, Save Our Forests and the Conservation Council associations! Through their efforts they have indirectly destroyed over 50 acres of my woodland and thousands of acres of other private woodlots. They have done this by their vocal opposition to the budworm spray programs, which in turn apparently convinced the government of this Province to establish a one mile "buffer zone" from residential habitation. It should be noted that most private woodlots are within one mile of human habitation."

I continue to another paragraph. This will be attached to the document by the way.

"It appears to me that the anti-spray groups are not interested in preserving the forests and the economy of the Province, but only in protesting and stopping the spray program at all costs. Should the budworm spray program cease without a viable alternative to control the spruce budworm, one can expect the softwood forest industry to collapse."

The economic situation of the day has given us a slight taste of the hard times when the forest-based industry is not operating at capacity. In this case, due to market demand or, should I say, the lack of demand, mills have had to shut down periodically and some permanently. The same situation would exist if demand was good but the wood supply was not there to run the mills. In 1982, the major pulp and paper mills operated at less than 80% capacity in this Province while 100 or so smaller lumber operations operated at 55% of capacity. This is called a depression or a deep recession and that is the state and possibly worse that would occur with a dead forest out there.

We know the benefits of spraying and its limitations, and we continue to ascertain through research whether there truly

is a health hazard associated with the program. Jointly funded research is ongoing in New Brunswick, in Canada and the United States.

In terms of harmful effects to the Environment, I would like to quote two people who have commented on the environmental effects of budworm spraying. Dr. J. R. Carrow, formerly Supervisor, Pest Control Section, Ontario Ministry of Natural Resources and now Assistant Deputy Minister, (Forest Resources) New Brunswick Department of Natural Resources, who recently said - And I quote:

"Environmental effects of large-scale budworm spraying have been monitored annually for some 25 years. This monitoring indicates clearly that the most serious effect on non-target organisms occurs as increased mortality in some terrestrial and aquatic insects, and that any depletions in numbers are short-lived, with populations recovering to normal levels in a few weeks."

"I would challenge vigorously the assertion that pesticide spraying programs in badly infested forests are more ecologically disruptive than the vast areas of dead forest which result from lack of protection."

And on this same subject, Dr. I. W. (Bill) Varty, Maritime Forest Research Center, speaking to the Acadian Entomological Society in April of 1981, made the following comments:

"I believe that the present forest spray strategy does not have profound implications for population trends of vertebrate or invertebrate animals in a detrimental sense, that is an imbalance of food chain relationships or interference in natural dynamics."

He went on to say:

"Songbirds have conifer insects to feed upon, squirrels have spruce cones for winter food, and deer have browse and shelter. You don't find those links in a spruce-fir forest killed by budworm, only in a live stand sustained by insecticide."

However, every year when spring rolls around and the spraying period draws close, a number of public pressure groups begin their annual campaign to ban spraying. It has almost become ritualistic with positions taken by both sides based on some declaration or the result of some study that had not surfaced until this time. The government predictably shows much concern and hesitates to go ahead until the last minute when the ultimate common good of the Province surfaces and spraying is allowed.

It is a scenario that is providing industry with a lot of concern.

We are following all the guidelines which government regulations stipulate. We are using the agents which are approved by the federal government. These same agents or pesticides had to go through rigourous testing procedures before they were licensed by the government. These procedures are spelled out to some extent in the Canusa brochure, "Are Pesticides a Risk" and I do have some copies of that brochure which will be attached to the brief.

Yet, every year we go through this time of uncertainty, of media ballyhoo and posturing by the protagonists which jeopardizes the spraying operation.

Timing is critical in this battle against the ravages of the budworm. You must get it as it feeds on the opened bud. And

this gives you a time span of approximately 15 days, to save that year's foliage. Delays, as you can see, would cut a full year's growth from that forest sector.

There is no opposition by industry in having constant reviews of the efficiency of these operations, the safety of the operations, the safety of the pesticides. This is done by industry and government regularly. Everything evolves in time and we will also have to evolve new and better alternatives. And as I mentioned, research is being carried out incessantly to effect some of these changes.

But in the meantime, industry must survive if people are to have jobs which will maintain their standard of living. Industry must realize profits if it is to fund continuing research to improve and preserve the environment. The opponents to spraying often characterize industry or the corporations that make up the industry as a huge juggernaut that tramples over the countryside in search of profit with no regard to anything, much less the environment or the safety of the public.

What these people seem to forget is that corporations exist because it is people that create them, and it is people that make decisions, and people that are directors, and people that are shareholders, and people that are employees. And, it's people that buy their products and all of these people are just part of the public like we are. And these people hunt and fish and hike just like any other people. These people marry and have children which they love just like anyone else and would not subject them to hazards knowingly. If these people support the use of pesticides, it may be that they have looked at the situation a little more objectively and realized that risk exists in everything that you do. We all took risks in coming here today. Some more than others. How many deaths or cases of sickness have been directly attributed to spraying?

None, that we know of. Speculation, yes; proof, no. Some people are not satisfied with that argument. And yet, we are asked to ban spraying. How many deaths will there be directly attributed to automobile accidents this year? No speculation, lots of proof. Yet, has anybody asked to ban the automobile? You see, we make decisions as to what risks we will accept and everyone of us does it many times during a day, most of the time without thinking, mechanically as it were.

Industry decisions are not made that way, they are made in concert in this case with the government, based on scientific evidence, surveys, reports, research experience on an annual basis, a five-year basis and a twenty-five year basis.

If every year the industry is faced with this situation of "to spray or not to spray" because of these pressure group compaigns, this again erodes the reliability factor of our resource.

Agricultural land has been domesticated to produce food of better quality and in greater quantities. This was achieved and still is achieved with the use of pesticides. Very few people look upon this as reprehensible behaviour by the agricultural community. Maybe it's because the product is food, a necessity of life. Well, a forest is a huge farm on which we grow a crop that has to be cultivated, fertilized and protected. The difference, I suppose, lies in the fact that few people eat trees.

But we have entered into the era of intensive forest management or management of the forest crops, if you will, domesticating the forest so that we can plan for and achieve the goal of multiple use of the forest as a perpetual provider of raw materials for industry, a provider of safe and sound wildlife habitat, a provider of recreational resource all in harmony with each other.

In order to achieve this goal, we have to use the management tools described previously. Time, research, experience may lead to better alternatives; they have in the past. Science is never static. Until that time, we have to proceed with the tools we are familiar with and know are effective to give us a sound reliability factor in terms of available resource, to maintain, and in time, expand our economic base in forest-related industries, thereby providing more job opportunities and access to a healthy and productive forest. Thank you!

MR. BROWNE: Thank you very much! Are there any questions from the Board? Thank you very much! I call on the next presentor, New Brunswick Forest Products Association ...

D.D. LOCKHART: Mr. Chairman, Members of the Board: My name is Lockhart. I'm executive director of the New Brunswick Forest Products Association and I make this presentation on behalf of that organization which represents the Forest Products Industry of New Brunswick. I should say at the outset that there may be a little bit of repetition in what I am to say following on the heels of Mr. Fyfe. I don't know whether he was looking over my shoulder when he wrote his or I wrote mine, and we were looking at each other's but there will be some overlap there. But I think it does serve to emphasize a point that both of us had seized on what to us seem to be the logical thing to put forward and so consequently have done that. I apologize at the outset also for going into some industry statistics. I'm sure you've heard them before; I know you have, you've heard them from me before, you must get sick of hearing them but I think in this day and age that repetition is necessary, simply to drive home the importance of the industry to the economy of the Province and to the Country at large.

1. Forests in New Brunswick cover 88% of the land area. And that is only 12% of New Brunswick is not forested. No other Province can come close to this figure.

2. There are 15,000,000 acres of forest in New Brunswick and 90% of these acres are classified as productive, which means that they can produce a crop of trees in 40, 50, 60 years.

3. Spruce and fir are our bread and butter species. In New Brunswick, some 80% of the wood used by the industry is spruce and fir; about 12% of our industrial use is hardwood but hardwood is the critical species for those mills using only hardwood as a round wood supply.

4. The forest products sector is unique in the Province in that it plays an important economic role in all regions of the Province, in both rural and urban areas. With two exceptions, it forms a key component of the industrial base in all major urban centres. In Moncton we do not see the industrial presence but at the same time, Westmorland County has 4,000 very important woodlot owners who contribute immensely to the provincial economy. In Fredericton, although there are no smoke stacks, the impact of forest administration, education and training have a major impact on the local economy. In many of the Province's smaller centres, woods work is the only source of employment and in over 900 communities the local sawmill is the main area of employment that people fall back on.

5. Forest resource processing represents one third of the employment in the manufacturing sector. Directly in the woods and the mills, 15,000 people are employed. In total, about 45,000 New Brunswickers are employed in forestry-related operations, including the local tire shops, equipment suppliers and service centres around the Province.

6. The forest industry exports about 90% of the forest products produced in New Brunswick. Forest products account for two thirds of all the goods exported from New Brunswick and these international markets bring 1 billion dollars per year into this Province.

7. Our wood supply for the next forty years is already out there in the form of an old run-down forest. The secret is to stretch this overmature, low quality, budworm forest for another forty years by protection and harvesting in the proper places. Control of the spruce budworm and fires on Crown Lands and the private woodlots are the most critical factors for the next forty years.

8. Our wood supply for forty years from now, depends upon planting, weeding, spacing and protection against fire and insects. We are creating a faster growing forest; it should be healthy, and our plantations should be resistant to the spruce budworm. With success in accomplishing our long range goals, our future looks excellent.

But there are people in this Province; there are peple in Nova Scotia, I guess there are probably people everywhere, who would deprive the forest manager of one essential tool of crop management and I refer to duly registered pesticides. Perhaps we all need reminding that forests are a crop, just like potatoes or beans or wheat. The crop, any crop, must have protection against fire, insects, disease and weeds. If any one of these agencies is present to a significant degree, the crop will be destroyed or severely depleted. But there are people who would take away this necessary tool, who would let the old crop and the new crop be destroyed, who would close plants, who would deliberately put people out of work because that, in my opinion, is the bottom line. Right now, these selfish people have targeted the forest industry, but assuredly

they will not stop there. As you can see from the following table, with only one half of one percent of all herbicides used in Canada in any year being used in forestry, and only four and half percent of all insecticides used in Canada in any year being used in forestry, and in as much as these pesticides registered for use in forestry were originally developed for use in agriculture - in light of all of this, gentlemen, perhaps some smart person will explain this paradox because to us it certainly is a paradox. And you'll see in the table there, gentlemen, where the figures are obtained from. And there's very small percentages that are involved in forestry applications.

PESTICIDE USE IN CANADA - 1980*

(LBS)

	Herbicides	Insecticides
Agriculture	36,270,000	18,180,000
Forestry	174,000 (0.5%)	827,200 (4.5%)

The figures in brackets is forestry use as a percentage of agricultural use.

*Source - Hall, R. H. 1981

Unfortunately, these people who would destroy New Brunswick's number one bread and butter industry make noises to the effect that instead of using pesticides, we should let nature control insect outbreaks. Well that's O.K. but will the outbreak collapse before or after it has destroyed the forest? That is a gamble that personally I would never want to take myself. On the Highlands of Cape Breton the budworm infestation has collapsed, yes. Why? Becaude there are no living trees left to feed on. We used to be able to accept these losses when wood was over-abundant. Now we cannot. And there's a following table there that would tell the story. And what the story is there, gentlemen, is the fact that if you take

the insect and disease loses through mortality and through growth and the total loss, you ccme out that in any one year that total loss is approximately 127,000,000 cubic meters. Our annually harvest is 200,000,000 cubic meters in Canada so as you can see, the annual losses represent 63% of the volume harvested. I would suggest to you that that is a most unacceptable figure.

We often hear it said that the forest is an environmentally sensitive ecosystem. And here, I don't think I will repeat what Mr. Fyfe said because he is simply repeating what Dr. Carrow said who is now our New Brunswick Department Natural Resources Assistant Deputy Minister. I won't read that again, but you have it in front of you. He also quoted from what Dr. Varty had said speaking on April the 9th with regard with ecosystems and their constantly changing aspects. I will just leave that because I don't want to take up the time and do it twice so to speak.

In conclusion, gentlemen, the forest industry of New Brunswick, the people of New Brunswick have a challenging job ahead; that is to maintain a vigorous, profitable and thriving forest base. We must manage. We are by law required to manage. To do so, we need all of the approved tools, and these include duly approved and registered pesticides. Thank you very much, Mr. Chairman and gentlemen.

MR. BROWNE: Thank you very much! Are there any questions from the Board? Don, do you have a reference for the figures quoted on top of page 5?

MR. LOCKHART: Yes, that came from Environment Canada from the Canadian Forest Service in Ottawa.

Mr. BROWNE: Do you have the specific reference?

MR. LOCKHART: I can get it for you but I do know that is a source. The author I don't know.

BOARD MEMBER: This is in reference to page 4 there. You're making your reference towards agriculture versus forestry, and I don't think that one would disagree with that on a Canadian basis. But then again, the majority of agriculture in Canada is in the West. How does that figure percentage breakdown in New Brunswick, if you ever work that out in terms of ...

MR. LOCKHART: No, I have not sir. But we could undoubtedly do it if it would assist you in your deliberations, I'd be delighted. I have never, I haven't seen it done but obviously with those figures, it would be an interpretation down the road that could be made and I'd be pleased to do it if it would help.

MR. BROWNE: With regards again to the second table, insect/disease losses in Canada's Forests, you show 62½ million cubic meters lost due to insects and 64.6 million lost to disease. What type of diseases are you talking about and are there any control programs for these diseases?

MR. LOCKHART: They are fungal diseases, infestations of a fungal nature, not insect caused.

MR. BROWNE: The second part of my question ... Are there any control programs presently being carried out to control these diseases?

MR. LOCKHART: Very limited. There are some in British Columbia but the extent of them is in that part of the country, we do not get into that to a large degree in Eastern Canada.

MR. BROWNE: Thank you! Any other questions from the Board? Dr. Tooley ...

DR. TOOLEY: I'm sorry, this is another question on the same table. What's the difference between mortality and growth loss?

MR. LOCKHART: When we were measuring the affect of disease of the forest, you have a mortality loss where you are counting the trees that are actually dead. The other one, of course, relates to the reduction of the growth because of the disease that is in the particular tree. So, it's either dead and counted as such or it's less than dead.

DR. TOOLEY: Now, I understand.

MR. BROWNE: Any further questions? Thank you very much!

MR. LOCKHART: Thank you sir!

MR. BROWNE: I would now like to exercise my prerogative as Chairman of the Board and call a 10 minute break. My watch says 9 minutes after nine. I'd like to start again at 20 after nine. Thank you!

GERALD BUYTING: I'd like to apologize for Tom Demma. He was supposed to be here. So I present this on his behalf and on behalf of the New Brunswick Federation of Agriculture.

The New Brunswick Federation of Agriculture, that's the general farm organization of the Province, comprises thirteen member organizations representing 2,200 farmers, presents to the

Pesticides Advisory Board this submission that will indicate the position of New Brunswick farmers to agricultural pesticide issues.

THE ECONOMIC FRAMEWORK: Agricultural production is a goods producing economic exercise. This economic activity serves to meet the food requirements of society within a North American market system having a relationship to supply and demand. Pricing of agricultural goods is conducted within the supply and demand framework and countered by cost of production constraints at the farm level. In other words, it's not cost of production but it's supply and demand.

Farmers produce quality crops within the economic constraints of total input costs compared to selling at the farm gate price. One costly input is agricultural chemicals which cannot be squandered by inappropriate handling or application.

There are a host of farm inputs; however, the agricultural chemicals and their cost is one that directly impacts upon quality of the product to meet consumer demand. Success of any crop enterprise is vital for farm success and viability.

The major point the NBFA would like to table with the Pesticides Advisory Board is the need to have agricultural chemicals available to farmers here in New Brunswick. This will enable New Brunswick farmers to produce crops as competitively as farmers in locations outside of New Brunswick and at the desired level of quality.

Agricultural chemical availability is an issue that's addressed by provincial government agencies. Unilateral action here to deregister or make unavailable a much needed agricultural chemical in New Brunswick could be a force that would be difficult for farmers to live with. This is why co-ordinated

national action as seen by activity of Agriculture Canada is preferable in the mind of New Brunswick farmers because external and artificial disadvantages do not arise at the production level. In other words, any action New Brunswick takes should be concerned with the rest of Canada. Otherwise, there could be chemicals taken off the market in New Brunswick that would be available to our competition.

Farmers concur with the need to have a balanced approach to environmental issues, inclusive of use of pesticides, and feel that it is incumbent upon government agencies to adhere to a balanced approach as well.

TRAINING: The issue of proper handling and the use of pesticides and generally agricultural chemicals is one recognized by the NBFA.

A submission to the Select Committee on the Environment of the Legislative Assembly made by the NBFA last spring explored this area thoroughly. The NBFA put forward a position that was determined positive and progressive.

In review, the position of the NBFA was one that called for an approach that would see government agencies engage in more training initiatives with farmers availing themselves of this extension, continuing education effort. Without this type of continuing education approach, the acceptance of restricting access and use of pesticides at the farm level by the farm owner-operator would be resisted. This is so because of the harshness and inequity that would lead to if put in place by a regulatory agency of the New Brunswick government.

PESTICIDE CONTAINER DUMPING: The NBFA is only slightly aware of the undertakings of the Department of the Environment in

this area of activity, although it is wholly supportive of it and its ideas.

It is hoped that the provision of pesticides container dump sites, coupled with proper on-farm rinsing of containers, has been a procedure that has brought benefit to the total environment. The expansion of this program throughout the Province needs assessment but is felt to be an exercise that farmers can get accustomed to without too much reluctance and additional cost.

PESTICIDE REGISTRATION: Over the past two years, there's been much activity in retesting and reexamining agricultural chemicals because of the IBT testing results that were not acceptable.

As a result of the retesting and reexamination, the majority of agricultural chemicals were rated anew with a categorization that, on general review, the farming community finds acceptable.

There are exceptions and Agriculture Canada and other federal agencies are attempting to make the best of a bad situation; that is, farmers need the chemical for economic production, yet there is no alternative for the chemical now in use. Although these instances are rare, they do not pertain to New Brunswick. Nonetheless, this provides indication upon the problems associated with the development of new and better chemical intervention agents for agricultural production in Canada and regions of Canada. Development, testing, and registration of new chemicals is costly for the chemical company. As a generalization, research activity is not undertaken unless there is a positive pay back involved; namely, that the use of a chemical will be acceptable and used in such quantities that its manufacture is economically viable. In itself, that is a contradiction but one that in inescapable both for farmers and regulators.

REGULATION: Regulation here in New Brunswick is of concern to farmers with regard to the use of pesticides when confrontation occurs. The same occurs when noise or odor pollution problems erupt.

Primarily, these are environmental impact problems compounded by human settlement adjacent to farms.

Most notable and common to all these problems is that they originate from a complaint basis and focus upon farmers, his customary activity that is not slipshod, yet finds fault at the hands of the individual or individuals laying the complaint. It is noted that this could escalate into legal action in the form of civil proceedings. There again, it's a comparison with farms keeping livestock and say manure disposal.

The NBFA indicates here that in most cases, the problem, although an environmental one primarily, is the result of the lack of a land use policy in the province that is compatible to or with agriculture.

Issues or problems arising when housing is allowed to encroach upon farm operations slowly but steadily. The story can be repeated over and over again with the solution not being more environmental regulation, but rather a sensible land use and housing policy that will allow agriculture to continue, to expand, and to prosper. The Pesticides Advisory Board should convey this message to the Minister of the Environment and, in turn, to the Provincial Cabinet.

With an acceptable and smooth functioning of land use policy, the needs of agricultural and non-agricultural pursuits can be addressed and provided.

The NBFA cannot support over-zealous environmental or pesticide regulation to address a human settlement, land use issue because it is inappropriate to do so. Also, this approach can threaten the existence of a viable agriculture and cause good agricultural lands to be unavailable for production solely because of its location. Thank you!

MR. BROWNE: Thank you very much! Are there any questions from the Board? With regards to pesticides container dumping, I'd like to refer you to a Study on Pesticide Use Practice in a Small Agricultural Watershed which is available at the table. No questions?

BOARD MEMBER: Mr. Buyting, on that pesticide container dumping, I assume that's a problem for most farmers, in disposal of containers and this sort of thing. Has there been any look at how many of these types of dump sites might be required throughout the Province or how they can be operated? I know that Alberta has one underway at the present time.

MR. BUYTING: Well, as we mentioned here, we're not aware of what is being done right now by the Environment Department. I guess there's been some studies done by the department, but the farmers themselves don't know much about it. But I think it would be preferable, and as we mentioned, we could live with it and I think it would be acceptable and probably even better than what we do now.

MR. BROWNE: I'd like to call on the next presentor, Mr. Russel of Russell & Swim Ltd...

MYLES RUSSELL: Mr. Chairman, Members of the Board: My name is Myles Russell. I am president of Russell & Swim. I also serve as woodlands manager for that company.

This is intended to be only a very brief statement to set forth the views of a logging and sawmill company regarding the use of pesticides as a tool in forest management. The opinions expressed are my own, but I believe they adequately reflect the views of the Company I represent and perhaps also a fair portion of the sawmill industry in New Brunswick.

My comments will deal particularly with the use of insecticides, with which I have had some association during the past thirty years. I am not sufficiently acquainted with the need or use of herbicides to offer comment with any degree of intelligence.

However, with respect to herbicides, I might offer this one comment; I suggest that the cutting practices which we are able to employ on some of our operations renders the use of herbicides unnecessary. I refer to partial cutting procedure which are designed to protect the next generation of trees, and which are possible in suitable forest conditions, and I emphasize that, "suitable forest conditions" on a small-scale operations such as ours. Such stands are, however, likely to incur an additional forest management expense to bring them to their optimum spacing.

With respect to the use of insecticides, I would offer the following experience. From 1952 to 1959, I was employed with one of the participating companies in the annual aerial spraying operation against the spruce budworm. I was sprayed upon several times during that period, and have to date suffered no ill effects, at least to the best of my knowledge.

Since 1959, I have been actively involved in planning and directing logging operations for my Company. From 1965 to 1966 plans had to be altered, to provide for the salvage of blowdown timber, caused by the hurricane of October 1963. Having acquired some measure of success in this project, it seemed an appropriate time to begin the salvage of budworm-damaged timber.

Since that time, our annual logging operations have been deliberately planned to secure the greatest degree of salvage, or in other words, to minimize losses in timber volume through tree mortality.

In all of this annual process, whether right or wrong, our efforts have been greatly aided by the annual budworm spraying operation, which kept trees alive until they could be harvested. This seems to be important to our Company, for if it had not been for the protection gained by the timely application of insecticide I would expect massive areas of forest to be dead and unsalvageable.

As a case in point, one of our 1982 operating permits was located in an area which had obviously not been sprayed for several years. I estimated that approximately 10% of the stand was not salvageable due to advanced decay, and a further 20% of the volume was reduced by sap-rot in the sawlogs and pulpwood which were salvaged. A sawmill operator cannot afford to operate in this forest condition for an excessive period during a time of economic recession.

In 1982 also, it became necessary to clear-cut an area of our freehold land due to the intensity of current budworm damage. Severe defoliation during the past three years forced the decision to clear-cut. Most of our freehold land lies within the restricted zone where no spraying is allowed.

I would like to point out that my plan for management of our freehold land and much of our Crown land operations deals with partial cutting. I prefer to use this method of cutting whenever the species mix and relative vigor of the remaining trees are suitable. In order to minimize damage to the residual stand or to advance regeneration, horses are used to yard logs

and pulpwood to roadside. This is a particularly effective method of harvesting in white pine stands, where many of the trees will benefit from increased growth following removal of neighbour trees.

It is also beneficial in mixedwood stands where an advanced growth of red spruce regeneration awaits the removal of old growth spruce and, it is fir and poor quality hardwood. It is less effective, when I say "it" I'm referring to the partial cut method, less effective in spruce-fir stands unless budworm populations are at a low level.

I visualize partial cutting as a suitable alternative to massive areas of clear-cutting with its attendant scarification, planting, and tending the new crop. But partial cutting is suitable only if forest conditions are right and if the trees are adequately protected from insect epidemics. And again, I wish to emphasize that "partial cutting" is suitable only if forest conditions are right and if the trees are adequately protected from insect epidemics.

What we are doing in our logging and sawmill operations in the Doaktown area, I see as very important to the community and the Province, and I would hope that every encouragement would be offered as incentive to keep it that way. Until a reasonable alternative is provided, in the form of a more effective forest management tool, I believe that protection of the forest through judicious application of insecticide must continue as a means of encouragement to forest industry.

Meanwhile we can surely hope that scientific investigation will have intensified to such an extent that new techniques will provide for the inception of natural control methods. Mr. Chairman, this is my presentation.

MR. BROWNE: Are there any questions from members of the Board? Thank you very much! I call on the next presentor, Mr. Everette Burell from Save Our Forests Incorporated. Is Mr. Burell present? I therefore call on Mr. John Labossière ...

JOHN LABOSSIERE: My name is John Labossière as you have stated it. I'm appearing here as a private citizen. I'd like to start off by noting that there are no women on the Board, a Board whose decisions directly and indirectly, in the immediate and in the more remote future, if there is one, affect children. And at the time the Board was expanded, it seems to me, that it would be incumbent on the government to see that there was representation from people who make up at least 50% of the population of the Province. The fact that this wasn't done would lead some people to certain conclusions as to the meaning of the way the Board is structured.

Speaking at York University in 1978, Dr. Samuel Epstein was pointing out that you cannot always trust scientific studies showing whether or not chemicals used in the workplace are hazardous.

He said, "You can buy whatever data you need. If you get answers inconsistent with your interests, you can destroy, manipulate, suppress and misinterpret. A whole set of scenarios have developed, all of which have the ultimate object of protecting short term industrial interests at the expense of society."

Sometimes, he said, untrue conclusions from scientific research are unintentionally reached, and sometimes they are deliberate.

"It ranges from extreme incompetence, which is commonplace, . to deliberate manipulation, setting up the experiments so you will get the answers you want. If you get answers you don't like, you can interpret them away or destroy the data."

In 1972 he said, scientists for a large chemical company published a paper on herbicides, which is used in Canada. They concluded that the substance doesn't produce birth defects. Now Epstein says this:

"I read through the whole paper and found that the study showed exactly the contrary to the summary. It showed a high number of birth defects, but the company scientists had defined birth defects in a way that holes in the heart and cleft palates would not count as defects."

"Do not, this is Epstein speaking, respect authority because it wears an academic hat. A wide range of industry consultants work at universities. Many at universities have done their best to fight against every attempt to regulate cancer causing chemicals." This is taken, by the way, from the Commonwealth, November 15, 1978. I have it here and I'll leave you a copy of it.

I could get into, right now, but I'll leave it till a little later, the whole question of people talking about agriculture and saying that because they use massive quantities of chemicals in agriculture, we should equally use massive quantities of chemicals in forestry. And this is said at a time when all across Canada, people are fighting, farmers are fighting, there's a research group in Saskatchewan that has presented briefs to the Environment Minister of Saskatchewan, there are people in Ontario who have formed organizations to fight the use of chemicals in Agriculture. And here we're

told, agriculture is a good example, they use lots of chemicals, let's use lots of chemicals. It's a bizarre and absurd kind of situation. I continue ...

Why should we be here again asking the Pesticides Advisory Board to advise the government not to spray and not to allow forestry companies to aerially apply insecticides and herbicides? By aerially, I mean from fixed-wing planes and helicopters. I specify this because I know that nitpickers, what nitpickers they are, spokespersons for industry and for government departments that support the industry position, they will come out with some statement like, "aerosol cans apply insecticides and other chemicals aerially." So, in a limited period of time, it will become necessary to cover the entire gamut of the madness that is the abuse of chemicals in North America. So I don't want to get into a whole bunch of side issues.

And it is a form of sociopathology. The abusive use of chemicals in North America is society destroying. News reports from Ontario tell of a witches brew of toxic chemicals leaking from dump sites in New York State and of a growing severity of contamination by these chemicals of the water supply of over four million people. Carcinogens, mutagens, slow, cumulative poisons, you name them, they have them. It seems no one can do anything to arrest or reverse the poisoning of Canada, the poisoning of the entire North American continent. And, any of you who saw the last issue of MacLean's magazine will know that the Americans are working on plans to divert water from Canada. They polluted their own water so bad, they're after ours now.

Recent news reports tell of attempts by farm workers in British Columbia to control the use of pesticides by farmers in that Province. Farm workers require this protection

against the way farmers are using pesticides. This year, a farm worker died from the effects of drinking water contaminated with pesticides. A number of farm workers were treated in hospital when they became ill after working in fields where pesticides had been recently applied. Here in New Brunswick it is standard argument from a spokesperson for industry that just as pesticides are needed for and by the agricultural industry so they are required in forestry.

The truth is that just as people are being appalled by the pathological use, the sociopathology which marks the use of chemicals in agriculture so are they becoming aware that the opinion formers who speak for government and industry in the forestry sector are embarked on a course leading to the destruction of the forests and of the people who need the forests.

If the spokespersons for the forestry interests are not mad, why are they using herbicides to kill hardwood when the market for softwood has collapsed? If government spokesmen are not intellectually deficient, why do they, and have they through the Crown Lands and Forest Act, turned over to the executives of the forestry companies the planning for the future of our forests? Surely, the shut mills and the tens of thousands of unemployed in the forestry sector testify to the incompetence; to the lack of insight and lack of foresight; the total lack of common sense and want of honesty of these people.

A few years ago, the main argument, and it was an emotional argument rather than one supported by facts or logic, by forestry sector people was that we had to spray or jobs would be lost. Well, we have sprayed and sprayed and sprayed, and sprayed again, for 30 years, and now we have forests devastated

by clearcutting, by cutting policies that see us critically short of saw logs, if we were to have a market for saw logs. We see ourselves needing hardwood to heat our homes, while industry people tell us they have to spay herbicides to kill hardwood. We see softwood markets, pulp and paper markets, collapsing and we hear industry people telling us we need monoculture stands of softwood. Monoculture stands of softwood invite insect infestations. So, logically or illogically, depends on how you want to look at it, we have industry telling us we must practice a type of forestry that will ensure a market for pesticides.

If this be not madness, if this be not sociopathological behaviour, then what dare we name it?

This is the last brief I shall present before the Pesticides Advisory Board. My reasoning is this: If you do your duty, if you act rationally, if you are not at the sole service of owners and executives of pulp and paper companies, you will publically recommend and recommend to government in private that no aerial spraying with herbicides and insecticides take place in future. If you do not so recommend, it is proof to me that appearing before this committee is totally futile. Thank you! Now, I'll entertain any questions ...

MR. BROWNE: Thank you very much! Could you leave a copy of that?

MR. LABOSSIERE: Absolutely. Are there any questions from the floor?

MR. BROWNE: Are there any questions from the Board?

MR. LABOSSIERE: No questions from the floor? Thank you very much!

MR. BROWNE: Thank you very much! I'd like to call on the representative from J. D. Irving Ltd.

DAVID OXLEY: Mr. Chairman, ladies and gentlemen: My name is David Oxley. I'm woodlands manager of J. D. Irving Ltd. and I appear here today in support of aerial spraying of pesticides and herbicides as necessary tools of intensive forest management in New Brunswick.

Our company is a major forest products company in this Province and has grown over the past 100 years from a single sawmill to a producer of 200,000,000 board feet of lumber annually, together with 300,000 tons of kraft pulp, 350,000 tons of newsprint and 90,000 tons of corrugating medium.

This growth and development has been made possible by the existence of quality forests which have grown in New Brunswick since time began . In these forests, we find black, white and red spruce, together with balsam fir, white pine and jack pine and these species, especially spruce, are the basis for our industry.

Until 10 years ago, we had operated from a wood surplus position, but since approximately 1970 increased industrial demand and mortality from repeated spruce budworm attacks have left industry in a shortfall position.

This situation has led to the necessity for more intensive silviculture which include planting, thinning, cleaning, developing shorter rotations with faster growing trees.

Our company has been active in reforestation in this Province for the past 20 years and we have some 160,000 acres of rapidly growing plantations in which commercial harvesting in the form of thinnings will start to take place during this

decade. This new forest will be much more productive through fuller utilization of the land by desirable species.

We have recently embarked on a tree improvement program to develop genetically superior trees to give increased growth, better form, improved wood characteristics and, hopefully, improved resistance to harmful insects and disease.

This whole challenging program has been carried out with the specter of destruction by insect or disease ever present.

We are tree farmers and as such have utilized the same principles to grow our crops as other farmers.

Protection from harmful insects and reduction of competition by weed species has necessitated the use of aerial spraying of pesticides and herbicides within these plantations as necessary since their establishment.

As we pursue this intensive silviculture, we must protect against a variety of pests. These include defoliators such as spruce budworm, spruce bud moth, cone and seed pests in seed orchards, fungi and diseases in our nurseries and possibly wood borers in our sawmill yards.

Spraying is carried out when absolutely necessary. This is very expensive, but the alternative is to go out of business.

Ladies and gentlemen, intensive forest management in New Brunswick without the use of chemical sprays is impossible, just as it is with intensive agriculture.

Many spray critics suggest there are methods of intensive forest management possible in New Brunswick without the use of chemical sprays. These critics are wrong. The past 30 years

of budworm spraying has been carried out so the present forest and the forest industry could survive. And this has been a successful program - crop protection has been achieved.

In 1980 our company carried out a study to measure the presence of dioxin 2,3,7,8 TCDD in areas where herbicide spraying with 2,4,5-T was being carried out. Samples of water, soil and fish were taken and analysed at two separate and independent laboratories, one in Canada and the other in the United States.

The results were then reported on by Dr. W. Kalow, an eminent pharmacologist at the school of medicine, the University of Toronto.

Dr. Kalow's results are summarized in a report which I have here and I'll leave it with you, but they're summarized in the following quote, and this is Dr. Kalow:

"In order to get this TCDD (that is 7 ng/kg) from a modern sample of 2,4,5-T containing 5.5 parts per billion of dioxin, a 70 kg person would have to eat regularly for months or years several teaspoons-full of the herbicide 2,4,5-T. I am unable to see how such an amount, or even a 10th or a 100th or a 1000th of it could possibly get into the system of somebody who merely lives near a district in which aerial spraying of forest land is conducted under the rules set up by the government of New Brunswick. To worry about that from the standpoint of human health is worrying about a non-problem. This would be a waste of time and effort; there are much more serious problems of the enviroment which deserve attention."

Ladies and gentlemen, it is appropriate that these hearings are taking place here on the Miramichi, a region that has its history tied to the lumber business since the days of William

Davidson to the present. Today, the mills on this river and throughout the Province are having a very tough time due to a serious recession in the industry. This is a serious but a relatively short term problem. However, if the ability to protect our forests is ever taken away, permanent reduction in the standard living and life style in New Brunswick will result.

Let's make sure this never happens. Thank you!

MR. BROWNE: Thank you! Are there any questions from members of the Board? Thank you very much! Is Mr. Burrell from Save Our Forests Inc. in the audience? Are there any other presentors? If not, I'd like to take this opportunity to thank those people who have presented briefs here this evening. Some I know have come great distances. Are you going to give a brief? O.K.

CARL HARVEY: My name is Carl Harvey. I live in Maugerville and I'm a farmer. And this is the third or fourth time I've been at some of these hearings, hearings like this. I wouldn't say in this manner but I find here than in listening to the forestry people, they have similar problems that we have, that is that they're concerned about damage from insects, damage from diseases. In fact, we use some of the same chemicals, and, some of the people at the other hearings, and here as well, they tell us that by good authority, the authorities that a lot of the farmers are using, the forestry people are using, the reports that they're presenting are, shall we say bent or twisted to fit the occasion. Now, in my case, I would like to, as I usually do, keep completely clear of official reports by experts and call on my own experience with insecticides, which I think is a good example of following the government recommendations that we have had through the many years, in my case over thirty years. We have found that by following these very carefully,

and as an applicator of course, being exposed to more than the average person, we are still staying very healthy. So, rather than going to the books and trying to twist things to fit your circumstance, I think that if you look around the Province, you've known many applicators, and we've had examples given to us, forestry people of being oversprayed a fair number of times, without any serious results or in most cases, any adverse effects of any kind. We have some examples in the farming industry of in fact past history if we want to go back, lack of chemicals and it's before our times of course. But we can think of when the poor Irish were trying to grow potatoes without pesticide of any kind and they lost their potatoes through blight and there was extreme famine. You know, if you people were to recommend and our governments were to remove some chemicals from us, we could have real disastrous results on our own continent or world over as far as that goes. But we need to use, not just what you hear from - the experts so to speak, but look at history. Look at the history of use of these chemicals. They have been proven over this number of years to be effective and safe. Now, we have people telling us that you can grow without chemicals. We question this, and we would like any of these people that say you can grow without chemicals to really come in and show us how it can be done because believe you me, it is an expensive business. And if I could reduce my use of chemicals safely, boys I would really welcome this. I'm really serious about this. But we're still waiting; we have been waiting quite a while for this but hopefully we'll get some chemicals that are maybe safer in some respects. We're using some chemicals now that are one one-thousandth as much to be lethal to the operator as some that we've used in the past. Although the effect to the insects was somewhat the same. I mean we can go to past history, you know some of the old chemicals, DDT of course, but it served its purpose, but it was reasonably safe to the operator. I mean, it may have made us sterile but

at least, we did reproduce enough anyway. I sometimes think of the people talking of ... as a forester you know, as a person that owns a forest or a fair bit of lumber land, and saying you know, you should just take a chance and let your forest go to natural elements, get away from using insecticides, let the natural predators look after your insects. As a person that owns a forest, I can't take that chance because I have generations coming after me, hopefully, that will make good use of this. And I can think in the agriculture end of it, a real good example, I've had people say this to me, you know, "Why don't you do like your grandfathers did? They grew potatoes and they weren't able to use insecticide on their potato bugs." True, they picked them and they bricked them you know, they squashed them. And maybe this is a consideration, maybe we should have all these unemployed persons or people that have very little to do, to go out and pick our potato bugs. I think that would of course be only part of the battle because we have aphids which we can't see very well, which we can't pick successfully because we lose, well bypass so many that they'll carry the disease into our potatoes to the extent we may lose crop after crop after crop if we follow this method. And what would, gosh I don't know, the cost of food as it is now, what would people do if they had to pay ten times what they are now paying for their food? And this could well be. I don't know if any of you people realize what it would cost to go out and even just weed an acre of corn? I mean they use to do it in the olden days when they got 10¢ an hour and we use to grow an acre or so of corn but that was our limit. And if you can imagine now trying to ... well, it's been proven in quite a number of cases that countries that are not using our methods of farming are starving. So, I think without further comment, I just like to close with that we need you people, we need you to recommend to the powers that be, that they be very careful in recommending that withdrawal to

chemicals that especially have been used safely for a fair number of years by following the letter of the law so to speak as laid down by our federal people that regulate this and for those people that are putting out these, shall we say tactics, I think they should take a second look at what we are doing, and have been doing for this many years, safely. I thank you! Any questions?

MR. BROWNE: From the Board? Thank you very much!

MR. HARVEY: Thank you!

MR. BROWNE: Is there anyone else who would like to make a presentation? If not, then I would again like to thank all the presentors.

APPENDIX A

SUMMARY FOR

THE PESTICIDES ADVISORY BOARD

from

Save Our Forest Inc.
R.R. #2, Nackawic
New Brunswick
E0H 1P0

President

Everett Burrell

I would like to thank the Chairman of the Pesticides Advisory Board for the invitation to present this summary concerning pesticides as our organization is totally against any aerial spraying of poison chemicals upon our forest in New Brunswick.

Mismanagement and so-called chemical warfare are destroying New Brunswick's forests and wildlife, because the 30-year old budworm spray program has been a failure, for there are more budworms in 1982 than in the 50's. These chemicals have poisoned our environment, crippled our wildlife and cause more diseases than in our neighboring provinces that don't use these chemicals. There is no control by government on our Crown Lands because the pulp companies cut, slash and destroy and poison us for a fast buck and greed and then get out and tell the people of New Brunswick that herbicides are a forest managing tool. This is propaganda and a misleading statement.

In 1982 we met with government officials concerning the dumping of poison chemicals upon our forest. We were told by Mr. Allen, then Minister of Natural Resources they were using water as an emulsifier. This was a deliberate lie to us and the people of New Brunswick as Concerned Parents Group named the emulsifier a few days later. Our proposal to the government was to use manpower instead of chemicals but they rejected our proposal and stated it was cheaper to use chemicals than to use manpower. I ask you is it cheaper to poison our environment, destroy our wildlife and poison the people than to use manual labour?

.../2

In 1980-81 some pulp companies bought 2,4-D and 2,4,5-T, the most deadly poison known to man that was banned in Ontario. These chemicals were bought from the Ontario Hydro and sprayed on our forest in New Brunswick. Also the New Brunswick government was interested in purchasing the other banned chemicals from Mr. Burt Andrews of Ontario but never succeeded. Is this good forest management to buy poison chemicals that are banned in other provinces and spray us with them? I would say it is a pulp company's conspiracy or a monopoly between chemical companies, government and pulp companies.

The New Brunswick government and pulp companies have no control of the spraying of herbicides because in 1980-81, the United States monitored the drift of the poison chemicals 100 miles away. Mr. Kipping, then Minister of Environment, stopped the spraying of poison chemicals on approximately 4200 acres near Fundy National Park this year, because of the danger of these poisons getting into the rivers, streams and domestic waters being used by park officials and tourists. If the government can't control the spraying of chemicals on this area how in hell can they control the poison chemicals from getting into the rest of the rivers, lakes, streams and domestic water in the rest of this province?

If the politicians believe these chemicals are not poison, they should drink a glass or two to prove to the people that it's safe and if they want to excrete do it in a plastic bag and put it in an incinerator. Quoted by: Dr. Rozee.

.../3

Poor forest management practices are causing a wood shortage, destroying thousands of prime forest ground, leaving hundreds of cords of usable wood to rot by the governments -- so called profitable clearcutting method. The mass destruction of prime forest ground, the planting of one species of trees and the method of forest harvesting are only borrowed from agriculture, and are causing a fast increase of many insects.

The spraying of herbicides upon the tree plantations is destroying the food habitat from squirrels to moose. The small hardwoods and raspberry canes etc. that grow in the plantations are great feeding grounds for the wildlife.

To have a healthy forest we must ensure that we have mixed stands of hardwood and softwood. With this kind of forest management it would minimize insects and disease related problems, and the spraying of poison chemicals upon our forest and environment would cease.

It's a sad day when government officials have to lie and deceive people of New Brunswick. With no forest management policies and the spraying of poisons, the forest is in peril. It's time the New Brunswick residents, wildlife associations, outfitters and other organizations join together to stop the spraying of poisons before it's too late. Save Our Forest Organization will fight to stop the spraying of poisonous chemicals and the method of clearcutting no matter the cost for we believe in employing people not poisoning them.

Signed by
Everett Burrell

APPENDIX B

LETTER TO

THE PESTICIDES ADVISORY BOARD

from

THE ASSOCIATION OF REGISTERED
PROFESSIONAL FORESTERS OF NEW BRUNSWICK
500 Beaverbrook Ct.,
Fredericton, N.B.
E3B 5X4

Signed by

E.L. Hughes, R.P.F.
Executive Director

November 22, 1982

The Chairman
Pesticides Advisory Board
Environment New Brunswick
P.O. Box 6000
Fredericton, N.B.
E3B 5H1

Dear Sir:

Thank you for the Notice of Public Meeting of the Pesticides Advisory Board to be held in Newcastle on December 14, 1982.

We in the Association of Registered Professional Foresters of New Brunswick, are not aware of new developments or of additional information that requires the preparation of a brief. Rather, we take this opportunity to refer you to the four briefs submitted in recent years, namely:

Brief on Spruce Budworm Spraying - Presented June 12, 1978
Brief on Spruce Budworm Spraying - Presented March 28, 1979
Brief on Spruce Budworm Spraying - Presented December 14, 1979
Brief on Pesticide Use in New Brunswick - Presented February 9, 1981.

A paper on "The Use of Herbicides" is currently being prepared for presentation to the Canadian Council of Resource and Environment Ministers. This is being done as part of a joint presentation to the CCREM by the newly formed Canadian Federation of Professional Foresters' Associations. We will forward a copy of this paper at a later date.

Yours truly,

Signed by
E.L. Hughes, R.P.F.
Executive Director

APPENDIX C

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by

THE CONCERNED PARENTS GROUP

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APPENDIX D

SUBMISSION TO

THE PESTICIDES ADVISORY BOARD

frcm

HAJO VERSTEEG
CONSERVATION COUNCIL OF NEW BRUNSWICK
180 ST. JOHN STREET
FREDERICTON, NEW BRUNSWICK
E3B 4A9

Conseil de la conservation
Nouveau-Brunswick

Conservation Council
New Brunswick

Submission to

The Pesticides Advisory Board

December 14, 1982

Foreword

The Conservation Council of New Brunswick is a non-profit, tax exempt organization that was formed in 1969. It devotes its efforts to improving the management and appropriate use of our natural resources by promoting the adoption of policies and legislation aimed at reducing environmental pollution, by informing the public on environmental issues, and by fostering environmental education. While the Council is a voluntary organization, we are able to draw on the knowledge of many experts in our membership to participate in a wide range of environmental issues.

Recent activities have included work on Conserver House - our demonstration centre for energy-efficient housing; a conference on endangered species; a provincial survey on environmental attitudes; a conference on acid rain and one on toxic wastes; and co-sponsorship of a newspaper recycling project. We have also been the New Brunswick representative at a number of national meetings of environmental non-governmental organizations.

TABLE OF CONTENTS

Foreward i

Table of Contents i

Introduction 1

Amendments to the Pesticides Control Act 2

Risk Assessment 4

Task Force Recommendations 5

Alternatives to the use of Pesticides

1. Pheromones 6
2. B.t. (Bacillus thruingiensis) 7
3. Improved Forest Management 8

Appendix 1: Environmental Risk Assessment: a Rational Approach to the Management of New Brunswick's Spruce Budworm Enigma. 12

References 19

INTRODUCTION

The New Brunswick government has recently made some improvements in the Pesticides Control Act. However, no matter how exemplary the legislation becomes, exposure to pesticides has the potential of causing serious health problems. Many of these have been documented in our previous briefs to the Pesticides Advisory Board and to the Select Committee on the Environment. We have, for example, repeatedly recommended that the Department of Health fully investigate the effects of past and present pesticide use on the health of the people of New Brunswick. While some steps have been taken to accomplish this, more needs to be done.

We have also recommended that the annual spraying of our forests with fenitrothion be ended. In its place, an integrated pest management program based mainly on improved forest management, pheromones and B.t. should be developed to deal with the budworm problem. To do this, we need to develop more experience with increased setback zones and with increased precision in spraying with smaller aircraft and with helicopters. We need to start using B.t. on an operational basis. (Recent reports indicate that B.t. at higher concentrations is as effective as chemical sprays.) We need to accelerate development of pheromones. We need to do a lot of things that we currently cannot afford because of our undue commitment to spraying.

These alternatives will require a bold departure from the type of risk assessment and decision-making that has brought New Brunswick to the present impasse on this issue. It would enable the time, effort and money now being spent on the spray to be used in a more rational and constructive manner. In short, it would provide an economical, safe and politically acceptable alternative to the present "no win" situation by focusing on real solutions ot the 30-year-old problem that besets us.

The Council reiterates its opinion that the absolute harm or safety of pesticides will never be conclusively proven. As a result, an objective assessment of the real risks involved should lead to a much more stringent application of all pesticides, and more reliance on safer alternatives such as low-risk biological controls and improved management practices, not only in forestry, but also in agriculture.

AMENDMENTS TO THE PESTICIDES CONTROL ACT

The Conservation Council of New Brunswick would like to congratulate the Department of the Environment for a number of critical amendments that have recently been passed with respect to the Pesticides Control Act. In particular, the significant increases in the penalty provision and the fact that the Crown is now bound by all aspects of the Act will better meet the goal of protecting the people of New Brunswick from the indiscriminate use of pesticides.

In particular, the increase in the maximum fine for violations of the provisions of the act from $1,000 to $50,000 and the increase of the maximum period of imprisonment from 100 days to one year are long overdue. The addition of section 30(1.2), which states that where an offence is committed on more than one day or is continued for more than one day, it shall be deemed to be a separate offence for each day... will also contribute to establishing a realistic deterrent to violations of the Act. We hope that these provisons will be vigorously enforced.

On several occasions in the past we have advocated broadening the membership of the Board, and have recommended that the Board should have access to the services of a competent toxicologist and an epidemiologist. The amendments under section 4(1) and the new section 6(4) should allow for these changes. We are glad to see the addition of one member from the Occupational Health and Safety Commission to the Board; this would ensure better representation of the interests of workers who are exposed to pesticides by the nature of their work. In addition, the provision for the appointment of up to two other persons would allow a broadening of the membership from a technical orientation to include lay input through representation of labour, academic or environmental groups. Such a step could allow the Board to better fulfill its responsibility to weigh need, assess pesticide data and judge risk, and could ensure that the Board assumes a multi-disciplined perspective.

Section 6(4) authorizes the Board "to retain such persons as it considers appropriate to advise the Board..." We urge the Board to take advantage of this new provision to avail itself of the services of a toxicologist and of an epidemiologist.

Finally, the amended s.28 which allows an inspector who has reasonable and probable grounds to believe that a person is using a pesticide in contravention to the Act or the Regulations to order that person to stop immediately such activity is a welcome addition.

There is, however, one section which the Conservation Council feels needs further clarification. Section 7(1) allows the Minister the discretionary power to exempt any person from any of the provisions of the Act or the Regulations. Pursuant to this section, Eric Kipping, then Minister of the Environment, exempted the non-aerial application by persons or their employees who apply pesticides to their own land or buildings from the provisions of s.16 of the Act. The result of this exemption is that large corporations have been allowed to apply vast

quantities of toxic pesticides without any type of direction or supervision by the Department of the Environment. Given the current state of uncertainty with respect to information concerning the potential toxic effects of many of these pesticides, such exemptions are simply unacceptable. While there may be some benefit derived from exempting small-scale agricultural interests from the requirement of obtaining a permit, the same cannot be said for large scale agricultural or forest spray programmes. The legislation should thus be amended so that the Department of the Environment has complete control over the use of pesticides in the province.

RISK ASSESSMENT

This spring, the New Brunswick Task Force on the Environment and Reye's Syndrome, headed by Dr. W.O. Spitzer, presented its report to the Minister of Health.

We feel that this report laid down some important principles for improvement of the conduct of the spray program which would tend to reduce the risks involved. We would like to congratulate the government on its decision to accept the substance of the task force recommendations, and hope it will continue to support them fully.

The principles governing the deliberations of the task force are important enough that they bear repeating here:

> " 1. The Task Force insists on observing the greatest possible margin of safety with respect to health effects. For instance, even if a programme or procedure currently in effect were judged to be acceptably safe by us, we did not and would not hesitate to recommend more stringent measures if they could be clearly expected to increase the margin of safety to people.
>
> 2. The Task Force refuses to contemplate any changes that could conceivably increase any risk above that of present practices.
>
> 3. Adverse health risks and environmental risks of all the alternatives the Task Force studied, including the risks associated with ceasing to spray for spruce budworm altogether, are taken into account in every decision. "

In all of these three principles, assessment of risks is crucial. However, in most cases involving the effects of poisons on complicated ecosystems, particularly long-term effects, because of their great diversity these effects can never be quantified and proven. We are in fact dealing with a new type of problem -environmental risk- as opposed to the traditional pollution problem. We cannot apply traditional dispute-resolving methods to these new hazards. We need a fundamental change in attitude by decision-makers. They must break away from the position that proof of harm is necessary and possible. The rationale for this belief is presented in detail in an article by Hajo Versteeg published in the Canadian Environmental Law Reports. This report is attached in its entirety as Appendix 1. We urge you to read it.

TASK FORCE RECOMMENDATIONS

The New Brunswick Task Force on the Environment and Reye's Syndrome made nine specific conclusions and recommendations in its report (pages4-8). We support these, and urge the government to act on all of these, and request the Pesticides Advisory Board to take them into consideration when dealing with pesticide application permits. However, there are several of these recommendations upon which we would like to place particular emphasis.

This spring, the provincial government discontinued the use of Atlox in the spruce budworm spray program because it did not meet the criteria recommended by the Spitzer Task Force. We support this decision, and feel that the government should continue to follow those guidelines in approving the use of any emulsifier or additive in any aerial spray program. As a matter of principle, no permits should be given for the use of any formulation which contains components of unknown safety or of questionable safety.

The Task Foce made an unequivocal recommendation that "solvents containing fractions of fossil fuel oil which in turn contain large amounts of polycyclic hydrocarbons...should not be sprayed into the environment." We strongly support this, and urge that this recommendation be enforced without exception not only in the set-back zones but throughout the entire province regardless of the distance from human habitation.

Any experimental permits should be granted only for locations as far from human habitation as possible. On June 8, 1982 Health Minister Brenda Robertson recommended that experimental spraying not be done within 5-10 miles of human habitation. We request that this be enforced in the future, beginning this year.

Several recommendations related to monitoring of diseases important to public health and adverse health effects which could be related to pesticides, and the carrying out of epidemiological studies on Reye's syndrome and other diseases. We have repeatedly urged that "funds should be allocated to the investigation of the effects of the spray program on human health", specifically:
1. a review of child mortality since 1952; 2. a province-wide statistical blood sampling program before, during and after the spray program if it continues; and 3. a statistical study of liver, kidney, CNS and bone marrow disorders in New Brunswick.

We are pleased that the Department of Health has established a Task Force to study the incidence of cancer in this province. We hope that such studies will be continued and expanded in the future.

The recent amendments to the Pesticides Control Act (Section 6(4)) could be used to allow the Pesticides Advisory Board to retain the services of an epidemiologist and a toxicologist. This could be in addition to the full-time provincial epidemiologist and toxicologist, both recommended by the Task Force.

ALTERNATIVES TO THE USE OF PESTICIDES

1. Pheromones

In the spruce budworm spray program, pheromones are by far the safest alternative to pesticides. They are non-toxic, and act on the budworm by modifying adult behaviour rather than by killing larvae.

Reductions in the number of matings of adult budworm exposed to pheromone have been shown both in the laboratory and in the field (1,2), and reductions as high as 99% in the number of males able to locate traps baited with female budworm have been demonstrated (3). In the summer of 1982, experiments done by Dr. W.D. Seabrook of the University of New Brunswick have shown that even when budworm populations are very large, high levels of mating suppression are achieved by concetrations of pheromone in the air as low as two nanograms (10^{-9} g) per cubic meter.

There is now no doubt that the mating behaviour of the spruce budworm can be profoundly disrupted in an atmosphere permeated with the naturally-occurring pheromone, or with a synthetic substitute. They have an excellent potential for successful suppression of budworm epidemics. In addition they are very effective at very low (endemic) population levels. Therefore, pheromones could also be used to prevent population build-ups from low to epidemic levels.

The Conservation Council strongly recommends that the government give the highest priority to supporting research on pheromones and development of an operational delivery system for them, so that they can be used to combat spruce budworm infestations at the earliest possible date. In view of their safety alone, there is strong justification for development of the use of pheromones as fast as is practicable.

In the U.S., not only have pheromones been used for many years in integrated pest management programs against a wide variety of serious pests to monitor infestation levels, but they are also used in widespread spray programs (particularly against pests of cotton). They are both effective and environmentally safe. With the experience accumulated in the U.S., it should be possible to bring the spruce budworm pheromones into operational use in the near future, and every effort should be made to do so.

Because pheromones do not attack larvae directly, they alone would not be able to replace chemical insecticides completely. We recommend that an integrated pest management program based on the use of pheromones, Bt and other biological controls combined with better forest management be developed as an alternative to continued spraying of biocides over large areas of the province.

2. Bt (*Bacillus thuringiensis*)

Bacillus thuringiensis is a bacterum which is specific to the larvae of Lepidoptera. As such, it is much less harmful to the ecology of the forest than biocides such as fenithrothion or matacil. The latter are toxic to all insects, including beneficial pollinators, predators and parasites, as well as having the potential of deleterious effects on birds, fish and people. These we have documented previously.

The Report of the 1981 Cooperative *Bacillus thuringiensis* (B.t.) Spray Trials (4) indicates that Bt has now been developed to the point where for all intents and purposes it is as effective as chemical biocides. Inconsistent results reported by F.P.L. in New Brunswick, and by others, appear to be due to the use of ineffective dose levels. The report says (page 6) "The data from the three jurisdictions indicate that operational dosage rates of conventional chemical pesticides are only slightly more effective than 20 BIU/ha of *B.t.* for spruce budworm control and similar in effectiveness to *B.t.* applied at 30 BIU/ha. Considering the environmental safety of the biological and in spite of its high cost, one must conclude from the three-year cooperative study that *B.t.* is an effective alternative to chemical pesticides and that it shoud be widely used, especially in environmentally sensitive forest areas".

B.t. also appears to have an advantage over the conventional chemical pesticides used in the spray program in that it can provide better protection to spruce forests.

A report published in 1981 by the Department of Natural Resources, Forest Management Branch (5), which assessed the damage caused by spruce budworm on spruce and balsam fir trees in New Brunswick, found that the damage to spruce was approximately the same magnitude in both protection and set-back (unprotected) zones. This indicates that for spruce, the conventional program has had little or no effect in protecting trees from defoliation. On the other hand, the 1981 trials (4) indicate that *B.t.* is effective in protecting spruce; 85% of white spruce, 93% of red spruce and 100% of black spruce treatments were successful (and 88% of balsam fir treatments were also successful), although in some of these cases population densities were low.

Thus it appears that *B.t.* may be more effective than biocides in protecting spruce, and just as effective in protecting balsam fir. We recommend that *B.t.* replace the use of fenitrothion or other biocides wherever there is any possibility that people would be exposed to the spray either directly or through drift.

3. Improved Forest Management

For many years the Conservation Council has been advocating the adoption of improved forest management practices as a means of reducing the susceptibility of our forests to the ravages of the spruce budworm.

Strict control of timber harvesting practices would allow for the break-up of the large stands of timber of uniform age which nature seems to prefer in our region. The establishment of "patch-work" patterns would not only improve and stabilize wildlife habitat and the run-off pattern, but would reduce susceptibility to insects, disease and fire.

Silvicultural practices can also reduce susceptibility to budworm by favoring less susceptible host trees. In the past we have supported the following recommendations:

1) More and more, natural regeneration after cutting should be replaced by planting seedlings grown from selected seed. The principal advantages of this course of action would be:
   a) genetically superior strains of trees can, and should, be planted.
   b) the species mix of the next timber crop can be chosen.
   c) well spaced seedlings will grow far better than naturally seeded trees.
   d) thinning and fertilization become practicable.
   e) more valuable products can be produced from larger trees grown in this way.
   f) the cost of harvesting will be reduced.

2) a) the capacity of the Provincial Forest Nursery be increased to provide the seedlings.
   b) genetically more desireable tree seed should be developed.

3) Densely regenerating stands of balsam fir should be thinned to improve growth and vigour.

4) Under favourable circumstances, fertilization of the stand following thinning may improve growth rates still more. Extensive pilot-scale trials in both thinning and fertilization should be initiated.

The advantages of following a forest management policy such as this are several. If has been estimated that the annual yield per acre may be anywhere from two to eight times that of the uncultivated forest. This will release large areas for other forest uses including fish and wildlife production, wilderness area, recreation and ecological research.

It could make extensive aerial spraying a thing of the past, replaced by selective spraying by ground machines or helicopters. It could result in reduced forest road construction with its attendant problems of soil erosion and siltation of streams. Finally, it could reduce the disturbance of wildlife thus increasing production while protecting endangered species.

Another forest management practice which can lead to great reduction in the spray program has been successfully used in Maine. They have found that by developing detailed maps of their forest area, and then spraying only those small areas which need protection, they were able to reduce the amount of pesticide used by over 40% but still maintain the same level of protection. While it is true that it is much more difficult to spray in small defined patterns than it is to spray large blocks of forest, the savings in pesticide, particularly if the more expensive B.t. is being used, would justify the extra effort. We strongly recommend that this province immediately adopts the practice of more accurately defining the boundariers of susceptible areas, and confines the protection zones to those small areas which will benefit most.

Finally, there has been a trend in recent years to mechanization of the forest industry. While this may appear to have economic advantages of reduced labour costs to the industry itself, we would argue that it may not be economical for the province as a whole, when the cost of unemployment and social assistance are taken into consideration.

As part of a broadened approach to a policy on the forest resource of New Brunswick, the Conservation Council propoces a new approach to management by chemicals:

> It is proposed that certain "impractical" options to chemical controls in forest management are not only viable in the context of the forest industry, but are of the utmost importance to the long-term future of the province. <u>The key lies in a careful examination of current and proposed options, in a broader context than has been customary.</u>

It is generally accepted that, quite apart from the current depressed state of the demand for industry products, the New Brunswick sector has, and will continue to have, stiff competition in world markets. Consequently, even the most vigorous critic has to admit that the forest industry can not make, or be forced to make, operational changes which, by lowering efficiency, or raising costs, weaken the competitive abilities.

It is equally true that, with the steady move towards what one might call "technological forestry", the labour component has dropped steadily. This is perhaps most evident in actual on-the-ground operations - but that is another aspect. Our concern here is with specific forest management techniques: positive intervention, as opposed to varied methods of harvesting the resource. Of these the best known are undoubtly chemical control of pests and of undesirable growth.

To this point there is no argument, simply two statements which, while apparently unreconcilable, can be accepted by any reasonable observer.

But who are the parties affected by the implications of the two positions? While the ability to compete is of obivous concern to the management and investors of the industry, ultimately the citizens - and their government - must be deeply concerned with the health and future of the province's major productive activity. In the other instance, while there can be no question of the direct concern of the members of the labour force no longer employed by the industry - and no doubt the deep concern of all citizens - neither can there be any doubt that the industry has a serious interest in the quality and availability of an adequate work force, now and in the future.

The immediate, understandable and familiar response is simply that the unemployment is regrettable - but in order to compete the industry must be modern, efficient and economical, and this means using the technological approach as opposed to any labour-intensive option.

To be specific: the industry - in a situation were softwood regeneration is desired following clear cutting - has moved to chemical supression of what, in that specific context, are unwanted hardwood species, and has rejected proposals for the use of manual elimination techniques - on the demonstrable grounds that the latter are more costly.

However, from the point of view of the citizens and, in the Conservation Council's opinion, there are other cost implications which, due to the nature of their magnitude, duration and implications, can no longer be ignored.

In the same sort of "hard" terms which industry must use, the province is coming to realize that it is the taxpayer who is paying for the consequences of the shift from labour intensity to technological intensity in the forest industry. It is the taxpayer - provincial and federal - who meets the immediate cost of this shift through Unemployment Insurance Commission payout; then the provincial taxpayer (at least directly) who meets the subsequent cost of UIC exhaustees who must turn to Social Assistance as the court of last resort.

Even more serious - and this cannot be over-emphasized - the documented evidence of the impact of dependence on the welfare state paints a grim picture of the future in New Brunswick: a work force of decreasing productivity, unwillingness to undertake necessary "dirty work", the bulk of the under-twenty-five-year-olds with no work experience and on and on.

In short, along with efforts to establish new industry, to "leap" into twentieth century technological production, and to educate and re-educate our work force, we must look at current industrial practices to determine whether or not it is feasible to combine the industrial imperative of cost effectiveness with the public imperative of improved utilization of human resources.

To offer a specific: we must examine the chemical controls now in use for supression of unwanted forest species, and determine whether it is in the public interest to develop a policy - a modus vivendi - under which industry can develop and apply a labour intensive option without economic disadvantage - and under which New Brunswickers will be employed, not only to earn a wage, but in order to live in dignity and pride, as contributing members of a self-sufficient society.

The Conservation Council does not presume to offer a blueprint for what would be clearly a complex social/political/industrial initiative. However, we do suggest that a straightforward examination will show that even those costs directly attributable to UIC, Social Assistance and the associated administrative costs clearly make a strong case for the validity and the urgency of this proposal.

As such an examination moves from these obvious costs, into related health, justice and education expenditures arising from prolonged unemployment and dependancy on welfare programs, the current totals and projections become staggering.

But the real cost, and the most difficult to measure, comes as an effort is made to assess the long-range impact on human, administrative and social systems and budgets. Perhaps these are best measured on a human scale - then projected by each observer in the light of the current unemployment statistics.

Emotions and prejudices aside, it is obvious that the welfare state is far from adequate, from almost every viewpoint. What is generally understood is the extent and the speed with which the system reduces a reasonably motivated solid citizen, with perhaps fifteen years of unbroken work record, to an individual liable to remain dependant for life, not because he wants to, but because he has been shamed into feeling totally incapable of looking after himself and his family. This phenomenon is painfully apparent to those working in the field, and can be documented or tested by anyone sufficiently interested.

We believe that the human resource of the province is the priority: we believe that it would be possible to identify activities where labour intensive programs could replace current technological (chemical) programs; and we believe that it is both desirable and possible to arrive at financial arrangements to make such alternate programs viable from the industry viewpoint.

ENVIRONMENTAL RISK ASSESSMENT: A RATIONAL APPROACH TO THE MANAGEMENT OF NEW BRUNSWICK'S SPRUCE BUDWORM ENIGMA*

Hajo Versteeg**

I. INTRODUCTION

On January 3rd, 1982, the Canadian Broadcasting Corporation aired a radio documentary entitled "The Poison Mist". This newscast outlined the possible link between the synthetic chemicals used in New Brunswick's annual spruce budworm spray program and the abnormally high incidence of cancer, birth defects and Reye's syndrome in the province.

Reaction to the documentary was swift and predictable. New Brunswick's Minister of Natural Resources stated that the government would completely scrap the program[1] if any danger to human health could be conclusively proven. The executive director of the Maritime Lumber Bureau said that his organization would continue to support the program "until 100 per cent positive proof is available confirming the chemicals used are damaging to human health".[2] And a vegetable

* Editor: Although this article deals with a particular issue, the comments in it are applicable to any environmental risk problem.

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farmer who has used pesticides for 33 years summed up his position succinctly: "If they are as dangerous as some suggest... I should have been dead long ago."[3] On the other hand, certain environmental groups argued that the spray program should be halted until it could be proven safe.[4]

One commentator felt he came closest to resolving this perplexing debate when he concluded: "The seemingly endless saga of the spruce budworm and Reye's syndrome can be reduced to a deceptively simple question: What is proof?"[5] Presumably then, the future of the spray program will be determined, once and for all, when one side "proves" its safety or its harm to human health.

The chemical response to the budworm infestation falls squarely within newly-defined and poorly understood environmental risk problems. The term "environmental risk" describes an activity which has *potential* adverse consequences, for which the underlying probabilities are uncertain and not detectable until some time in the future.[6] Examples include the risk of groundwater contamination near hazardous waste disposal sites, the risk of leakage in the disposal of nuclear wastes and the risk of using pesticides which may or may not be carcinogenic, mutagenic or teratogenic.

In order to make proper managerial responses to environmentally damaging activities, decisionmakers must be given all relevant information concerning those activities. However, scientific information regarding risk problems is by definition unavailable or uncertain.[7] These two features ensure that proof-of-harm concepts are irrelevant when managing risk activities such as the annual spray program.

The purpose of this comment is threefold. First, the history of the budworm wars will be outlined to stress the magnitude of the reliance upon synthetic chemicals in combatting the budworm and to document the development of the proof-of-harm concept as the official response to criticism of the spray program. Secondly, the fallacy and danger of relying upon proof concepts in managing the spray program, and an alternative approach, called environmental risk assessment, will be examined. Finally, the mercurial events surrounding the 1982 spray campaign will be investigated as a possible source of hope for a more rational approach to resolving the budworm dilemma.

II. THE BUDWORM SPRAY PROGRAM

The spruce budworm is indigenous to the forests of eastern Canada.[8] Every spring the larvae emerge from their cocoons and feed upon newly-formed fir and spruce foliage. During the last several hundred years, budworm populations have periodically erupted to epidemic proportions. These outbreaks, lasting from 5 to 10 years, are part of the normal maturation process of spruce and fir forests. In New Brunswick the commencement of the outbreaks have been traced to 1770, 1806, 1878, 1912 and 1949.[9]

Historically, a budworm infestation was not considered a serious threat to the province. However, circumstances leading up to the 1949 outbreak dramatically altered this perspective.[10] During the 1920s, the emphasis in the forest industry switched from lumber to pulp and paper. Spruce and fir, once considered weed trees, were now valuable commodities. In order to ensure their continued supply, the pulp and paper industry demanded that these forests be given maximum protection against budworm infestation.

The development of DDT and the refinement of aerial application techniques were hailed as the quick and inexpensive solution to the 1949 outbreak. Thus, in 1952, approximately 186,000 acres of infested forests were aerially sprayed at a dosage rate of one pound of DDT per acre.[11] The operation was considered a success; over

99% of the budworm in the sprayed area had been killed.[12] However, this triumph quickly gave way to consternation upon discovery that the 1953 infestation was four times larger than in 1952.[13]

And so began the annual spring war of attrition between New Brunswick and the budworm. In the course of this 30-year battle,[14] over 80 million acres of New Brunswick forest have been drenched with hundreds of millions of pounds of highly toxic chemicals,[15] including DDT, phosphamidon, matacil, and fenitrothion, along with a variety of emulsifiers, solvents and diluents.[16]

III. THE PROOF ISSUE

Despite early warnings against the indiscriminate use of pesticides,[17] public opposition to the spray program remained dormant for approximately 24 years. However, in the mid-1970s, scientific research pointed accusingly at the possible link between Reye's syndrome, a rare, often-fatal childrens' disease, and the chemicals used in the spray program.[18] Mounting public concern intensified when the government announced that the 1976 spray campaign would cover approximately 10 million acres, the largest to date.[19] The newly-formed Concerned Parents Group argued that the mere fact that a possible connection between Reye's syndrome and the spray program might exist was reason enough to abandon it. Pesticides should be considered guilty until proven innocent.[20]

The government, however, took the view that risk to human health would have to be unequivocally proven before spraying would be halted.[21] When a panel of experts convened by the Minister of Health was "unable to conclude that there is a direct linkage between ...Reye's Syndrome in humans and the forest spraying operations"[22] the government announced that the 1976 program would continue as planned.[23]

Since 1976 the proof-of-harm concept has been continuously used by the government to counter any concerns about the possible adverse health effects of the annual spray program. When announcing the 4 million acre 1978 campaign, the Minister of Natural Resources stated:[24]

> I don't want to go down as the man who kills babies, but so far there's no definite link between Reye's syndrome and our spraying.

In 1979, Health Minister Brenda Robertson stated that there was no absolute proof of any connection between the Reye's syndrome death of a child who lived in a heavily sprayed area and the chemicals used in the spray program.[25]

In February, 1982, Natural Resources Minister, J.W. Bird responded to the intensive criticism levelled against the spray program following the CBC documentary, "The Poison Mist":[26]

> We don't think that there is any evidence at this stage that we are causing significant...damage to the environment nor is there any compelling proven evidence that there is a question of safety to health.... Up to now there has been no demonstrated conclusive evidence of environmental damage or health hazard.

IV. PROOF OF HARM vs. RISK ASSESSMENT

Traditionally, the resolution of disputes has centred upon the legal concept of proof of harm. As a general rule, the law will only punish a "wrongdoer" when the complainant can prove that his injuries

were caused by that wrongdoer. Criminal law provides us with a good example.[27] A person is presumed innocent until the state can prove his guilt beyond a reasonable doubt. If the accused person is not demonstrably proven guilty of the charges against him, he is allowed to go free. The traditional dispute resolution model assumes that lack of proof of guilt means proof of innocence. Thus, a person who is in fact guilty will be declared innocent whenever the state cannot *prove* his guilt. Our society has made a conscious policy decision to accept this result because high priority is placed upon the right of individual liberty. This principle is aptly expressed by the maxim: better that 100 guilty people be declared innocent, than one innocent person be declared guilty.

Historically, proof-of-harm rules provided an acceptable method for resolving environmental conflicts. Society viewed its natural resources as limitless, great stock was placed in industrial and economic growth and there were relatively few serious environmental issues.[28] When risk problems began to emerge after World War II and, more prominently during the late 1970s,[29] decisionmakers naturally attempted to resolve them by using the traditional rules. If the complainant could not prove that a risk activity was harmful, it was assumed safe and allowed to continue.[30]

However, risk problems are inherently incapable of proof because the scientific information needed to establish proof is unavailable or equivocal at *the time* the decision concerning the activity must be made.[31]

Two principal characteristics of risk activities determine that information needed to prove the risk is unavailable or equivocal when the decision must be made.

First, the vast number of components in any given ecosystem, and the multiplicity and complexity of the interaction between components within and amongst different ecosystems ensure that a particular ecosystem is practically impossible to analyse.[32] If an ecosystem cannot be properly described, then the full effects of an external stimulus, such as a chemical pesticide, upon that ecosystem can never be fully described. Thus, information concerning the effects of the external stimulus is unavailable or uncertain.

An interesting example of this limitation is provided by *Bridges Brothers Ltd. v. Forest Protection Ltd.*[33] The plaintiff company alleged that their blueberry crops had been damaged by the defendant's budworm spraying operations. The plaintiff argued, *inter alia* that the fenitrothion killed insect vectors that spread blood parasites responsible for avian sickness and death to birds.[34] The resulting increase in the bird population in and about the plaintiff's blueberry fields adversely affected the quality and quantity of the harvest. A defence expert, noting that the scientific evidence did not prove this allegation stated:[35]

> It would be difficult to draw scientific conclusions without much more data on the birds, their parasites, the vectors and their feeding on the birds.

Even the plaintiff's witness conceded that this area of study was only at the stage of hypothesis "concerning which...the various interrelated factors are clearly so complex as to pose the need for ongoing research."[36] This aspect of the case was therefore rejected by the court because the plaintiff was not able to obtain enough information to prove it.[37]

The second limitation which restricts the nature of information attainable from an ecosystem when dealing with a risk activity involves the inability to identify causal relationships.[38] In the traditional dispute resolution model, the plaintiff must present enough factual information to prove that his specific injuries were directly caused by the activity of the defendant. Aside from the restrictions imposed by the complexity of ecosystems, two other features of risk problems make the positive identification of causal relationships difficult. The first phenomenon, known as latency, arises when the effects of a particular activity are temporally or spacially remote from their initiating activity.[39] The second, called synergism, determines that the effect of two factors acting together may be greater[40] than the sum of the effects of the factors operating separately. The significance of latency and synergism in masking causal relationships is aptly described in the Sixth Annual Report (December, 1975) to the President by the Council on Environmental Quality.[41] The report notes:

> Chemicals may appear safe for human exposure after they have been used for 10 to 15 years without obvious harm. With carcinogens, however, the lack of demonstrated damage to health even after this comparatively long period presents a false sense of security. Thirty or forty years may be required before enough individuals have been exposed to a carcinogen at sufficient intensity to produce detectable cancers. The long delay between exposure and symptoms often makes it medically and scientifically impossible to identify carcinogens in the environment.... Moreover, people are exposed to carcinogens in great variety and concentration not only on the job but in their diets and surrounding environments; this multiplicity of exposure further complicates identification of causes for any given cancer.

The New Brunswick approach to the budworm problem begins with the presumption that there is no health risk associated with the use of the sprayed chemicals and requires that the health hazard be proven.[42] As this standard of proof has not yet been met, the wholesale use of chemical pesticides to combat the budworm is considered an acceptable management technique.

But, the scientific information needed to properly evaluate risk activities is unavailable or uncertain. It may take 10, 20 or 30 years before evidence is available which can conclusively establish (or reject, as the case may be) a causal link between the chemicals used in the spray program and adverse health effects. A decisionmaker confronted with the issue of whether an "accused" spray formulation is safe or harmful is reduced to saying: "I simply do not have enough information to decide *one way or the other*. There is no evidence today that conclusively proves harm. But new information might be uncovered in the future which does establish harm." It is therefore an error for the decisionmaker to adopt the traditional model and conclude that lack of proof of harm means proof of safety.[43] Such a conclusion is potentially catastrophic because it allows for the wholesale use of the chemical with only moderate restrictions. If, at some future date, the causal link between the sprayed chemicals and the high incidence of cancer, birth defects or Reye's syndrome is proven, remedial action will be impossible. Damage to human health will have been done and will be irreversible.[44]

Society accepts error in the traditional model (better that 100 guilty be freed than one innocent be convicted) because high priority is placed upon individual liberty. But when managing toxic chemicals, society's primary concern must be with public health, not individual freedom. It would be absurd to accept the proposition that it is better that 100 harmful chemicals be declared safe than one safe chemical be declared harmful.

Environmental risk assessment attempts to identify and evaluate activities with potential adverse consequences with the goal of developing an affirmative response to minimize the potential for harm. A critical element of risk assessment includes an independent, detailed analysis of the economic, social, health and environmental impacts of the disruptive activity, and the alternatives thereto. To date, no such study of the budworm spray program has been undertaken. Risk assessment does not saddle itself with the insurmountable proof difficulties. Rather, accepting that the potential harm of an activity is often incapable of immediate proof, the system strives *to balance* all of risks and benefits in order to make the most informed managerial response to the activity. The decisionmaker who adopts this system in an effort to minimize the potential for harm will always make better responses when confronted with risk activities than the decisionmaker who is guided by the false assumption that the activity is safe until proven harmful.

V. THE 1982 CAMPAIGN

On February 15th, 1982, Health Minister Brenda Robertson established a second task force to examine the possible link between the budworm spray program and Reye's syndrome.[45] On March 19, before the task force could meet, Natural Resources Minister J.W. Bird outlined the plans for the mid-May spray campaign.[46] Over 5.7 million acres would be treated with more than 2 million pounds of fenitrothion, at a cost of $17 million. The spraying would occur within 1000 feet of human habitation.

Labelling instructions affixed to each canister of fenitrothion concentrate state that the pesticide can only be sprayed in a diluted solution using either a water or an oil base.[47] Because fenitrothion is itself an oily substance, it can only be mixed with water if an emulsifier such as Atlox 3409 is added. If an oil base is used, the solution must also contain a solvent, such as Dowanol or Cyclosol 63, to help thin and mix the fenitrothion. The proposed 1982 formulation, which had been used for the last several years, called for the spraying of the water-based solution using Atlox as the emulsifier. But the potential viral enhancing qualities of Atlox subjected this chemical to severe criticism in the CBC "The Poison Mist" documentary. Reye's syndrome is believed to be a viral disease.

The task force began its work on March 23rd[48] and presented its recommendations to the government on April 16th,[49] just weeks before the spray program was to begin. Its report stated that "there is no basis, *at the present time*, for concluding that a relation exists between the aerial forestry spray programme and Reye's syndrome" (emphasis added).[50] The report also noted that, to date, there was no scientific evidence to show that the use of fenitrothion at its current level of application presented a discernable public health hazard.[51]

Nevertheless, certain recommendations were made which had profound effects on the impending spray campaign.[52]

The task force report states:

> Our own data and a review of the scientific evidence have not revealed that Atlox 3409...is implicated in any alleged increase in the incidence of Reye's syndrome.... Nevertheless, since questions about the role of such emulsifiers in the pathogenesis of Reye's syndrome are being investigated...the Task Force considers it prudent to recommend that, beginning this year, another emulsifier be used.

The report went on to recommend without qualification, that fossil fuel oils should not be sprayed into the environment because they contain some impurities whose toxicity is wholly unknown and other impurities whose acute toxicity and/or carcinogenic effects are well known.[53] The report cautioned that chemical substances should not be introduced into spray formulations unless the standard federal governmental toxicological evaluations had been done.[54]

Thus, even though the task force cleared the use of fenitrothion for the 1982 spray program, the government was in a very delicate position. If Atlox was not used, the water-based fenitrothion formulation would have to be eliminated. No other emulsifier had been registered for aerial application by the federal authorities.[55] This meant that only the oil-based formulation could be used. But the task force concluded that oils should not be sprayed into the environment under any circumstances.

The government's response was presented to the New Brunswick Legislature by Premier Hatfield on May 19, one week before the spray program was scheduled to begin.[56] Approximately 3.5 million acres, no closer than two miles from human habitation would be treated with a 20 ounce per acre formulation of fenitrothion (three ounces), Cyclosol 63 oil (seven ounces) and fuel oil 585 (ten ounces). About 500,000 acres, within two miles and up to 1000 feet of human habitation would be treated with a ten ounce per acre formulation of fenitrothion (three ounces)and Dowanol (seven ounces). Atlox would not be used in the 1982 campaign.[57]

The government's 1982 spray operations rejected the spirit and the letter of the task force report. Despite an unqualified recommendation to the contrary, over seven million pounds of fossil fuel oil were sprayed over New Brunswick forests.[58] The new fenitrothion/Dowanol formulation sprayed within 1000 feet of human habitation had not been subjected to the standard federal toxicological evaluations.[59] Moreover, this formulation may be in breach of relevant federal and provincial pesticide control legislation. According to Regulation 45 of the federal *Pest Control Products Act*,[60] the labelling instructions on pesticide canisters must be followed. The label on fenitrothion canisters states that the concentrate cannot be mixed with any substance other than oil or water. Yet Dowanol is not an oil. Section 18(b)(i) of the provincial *Pesticides Control Act* states that no person (including a Crown agency) shall use a pesticide in a manner contrary to the manufacturer's written recommendations as to its use, contained upon the pesticide container.[61] Finally, the Premier's assurance in the Legislature that "we have decided not to use the emulsifier Atlox in this year's program"[62] was short-lived. The Department of the Environment granted on Ontario-based federal agency an experimental permit to spray a water-based formulation of matacil and Atlox on 10,000 acres of forest, 12 miles from the provincial capital and about 2.5 miles from a boy scout camp.[63]

Despite the rejection of most of the task force recommendations that directly interfered with the 1982 campaign, a number of the more general recommendations provide some hope that a better approach to the budworm problem could be developed. The theme of these risk assessment recommendations involves the collection and evaluation of scientific information concerning possible adverse health effects of the annual spray program. They are as follows:

> 1. The province must improve its system of surveillance of diseases. Reye's syndrome should be made a reportable disease. Complete information concerning the composition and testing of all toxic substances and evidence of their safety and risk must be readily available to all relevant authorities. A full-time medically-qualified epidemiologist and a toxicologist should be hired to coordinate and evaluate these information gathering activities.[64]

2. Additional task forces should be established to examine the possible link between the sprayed chemicals and cancer and birth defects in the province. Moreover, a permanent, well-funded advisory committee of multi-disciplined experts, drawn from within and outside the province, should be created. This committee would be responsible for collecting and evaluating existing and emerging scientific evidence that has a bearing on the health effects of substances introduced into the environment.[65]

3. Research to find increasingly safe and feasible alternatives to synthetic chemicals should be vigorously promoted and generously supported.[66]

In the 30 years since the commencement of the spray program, none of these policies have been actively pursued. It is hoped that an emerging understanding of the serious and difficult problems posed by environmental risk activities will convince the government to abandone its traditional proof-of-harm model in favour of the more enlightened risk assessment approach in coming to terms with the budworm dilemma. A policy adopting the recommendations of the task force report would be an excellent and urgent starting point.

VI. NOTES

1. "If Health Hazard Conclusively Proven N.B. Would Halt Spray Program", *The Daily Gleaner*, January 5, 1982, p.1.

2. "Briefs Argue Spray Safety", *The Daily Gleaner*, January 13, 1982, p.3.

3. "Farmer Defends Spraying", *The Daily Gleaner*, January 15, 1982, p.3.

4. "Briefs Argue Spray Safety", *The Daily Gleaner*, January 13, 1982, p.3.

5. "Budworm Spray-Reye's Syndrome Link: No Conclusive Evidence Found", *The Daily Gleaner*, January 8, 1982, p.1.

6. Talbot Page, "A Generic View of Toxic Chemicals and Similar Risks", 7 *Ecology Law Quarterly* 207, (1978), at n.1.

7. See text accompanying footnote 31 *infra*.

8. An excellent summary of the spruce budworm spray program is provided in *Bridges Brothers Ltd. v. Forest Protection Ltd.* (1976), 14 N.B.R. (2d) 91 (Q.B.), at pp. 103-107. See also: Lund, Wilk, Scott and Goodall (eds.), *Study of Alternatives To State Management of Spruce Budworm Spraying*, Maine, Department of Conservation, (1979), at pp. 1-5; Elizabeth May, "Canada's Moth War", 19 *Environment* 16, (Aug./Sept. 1977).

9. *Bridges Brothers*, supra, n.8, at p.103.

10. *Ibid.*, at pp. 103-104.

11. D. Henry, "Summary of Forest Spraying - N.B. 1952-1975 Inc.", Prepared for Forest Protection Limited, (February 20, 1976).

12. *Bridges Brothers*, *supra* n.8, at p.105.

13. May, "Canada's Moth War", *supra* n.8, at p.17.

14. 1959 was the only year in which operational spraying against the budworm was not carried out.

15. R. Wilson, P. Eaton, S. Hall and M. Stone, *Environmental Quality In The Atlantic Provinces 1979*, Environment Canada, Environmental Protection Service, Atlantic Region, (May, 1980), at pp. 76-77. The report notes, at p.75, that from 1952 to 1968 over 12.5 million pounds of DDT were sprayed over New Brunswick forests.

16. Usually a pesticide is diluted with water, oil or some other thinning agent before it is applied to the target area. Emulsifiers are used to mix oil-based pesticides with water. Solvents allow the pesticide to mix thoroughly with the diluent. Many of the emulsifiers and solvents are considered to be as toxic as the active ingredients.

17. Rachel Carson's 1962 classic, *Silent Spring*, (Boston: Houghton Mifflin Co., 1962), at pp. 129-152 vividly describes the destructive use of DDT in New Brunswick.

18. J. Crocker, K. Rozee, R. Ozere, S. Digout and O. Hutzinger, 2 *Lancet* 22, (1974). See also the Report of the Panel Convened by the Government of New Brunswick, "Forest Spray Program and Reye's Syndrome", (27 April, 1976) especially the selected bibliography at p.15. The concern expressed by the scientific researchers related not only to the active ingredients in a pesticide formulation but also to the emulsifiers. See, for example, pp. 16-17 of the "Forest Spray Program" Report.

19. "Biological Warfare in New Brunswick", *Weekend Magazine*, August 7, 1976, p.1.

20. *Id.*, Part VI.

21. *Id.*, Part V. See also Ross Howard, *Poisons In Public*,(Toronto: James Lorimer and Co., 1980), at pp. 47-56.

22. "Forest Spray Program" Report, *supra*, n.18, at p.14. The Panel released its findings after three days of meetings. See p.2 of the Report.

23. "Biological Warfare In New Brunswick", *supra*, n.19, at Part VI.

24. Howard, *supra*, n.21. at p.57.

25. *Ibid.*, at p.58.

26. H. Thurston and staff, "The Enemy Above: People vs. Pulp in New Brunswick", 42 *Harrowsmith* 36, (April/May, 1982), at p.51.

27. The use of the criminal law model juxtaposed with the risk assessment model is adopted from Page, *supra*, n.6, at pp. 219-220 and 230-36. The article is well worth reading in its entirety.

28. J. Krier, "Environmental Litigation and the Burden of Proof", in Baldwin and Page (Eds.), *Law and the Environment* 105, (1970), at pp. 107-109 expands upon this concept.

29. Barry Commoner, *The Closing Circle*, (New York: Alfred Knopf, 1971), at pp. 140-177 attributes the post-war development of risk problems to the change in the technological structure of Western society. See also Page, *supra*, n.6, at pp. 216-219.

30. See sources outlined in footnote 31, *infra*.

31. The following discussion outlining the unavailable or equivocal nature of information concerning risk activities is described in an excellent article: M. Gelpe and D. Tarlock, "The Uses of Scientific Information In Environmental Decision-making", 48 *Southern California Law Review* 371, (1978). See also: D. Large and P. Michie, "Proving That The Strength of The British Navy Depends On The Number of Old Maids In England: A Comparison of Scientific Proof With Legal Proof", 11 *Environmental Law* 555, (1981); J. Katz, "Casenote - Environmental Law", 25 *Catholic University Law Review* 178, (1975).

32. Gelpe and Tarlock, *supra*, n.31, at pp. 396-404.

33. (1976), 14 N.B.R. (2d) 91 (Q.B.).

34. *Ibid.*, at p.123.

35. *Ibid.*, at p.124.

36. *Ibid.*, at p.123.

37. The plaintiff was successful on other grounds.

38. See generally Gelpe and Tarlock, *supra*, n.31, at pp.404-407.

39. *Id.*

40. *Ibid.*, at p.410.

41. At pp. 27-28 of the Report.

42. See text accompanying footnotes 21-26, *supra*.

43. This clever and descriptive phrase was used in D. Williams, "Law and The Environment", 3 *Otago Law Review* 372, (1975), at p.384. The complete sentence reads: "Could we safely say that lack of evidence of harm equalled probable proof of safety and thus justify only very limited action against the particular pollutant."

44. Page, *supra* n.6, at pp. 231-232 provides a useful, albeit confusing example of this problem. I will attempt to simplify it somewhat. Suppose that a barrel contains a number of apples (safe pesticides) but might possibly contain one orange (an unsafe pesticide). A decisionmaker is asked to determine whether or not the barrel contains the orange but is only allowed to look at the top layer.

Using the traditional dispute resolution model, the decisionmaker who looks at the top layer and does not see the orange will rule that the presence of the orange has not been proven. Therefore, he will conclude that the orange is not present in the barrel, even if in fact it is present but hidden by the top layer of apples. If our concern is to protect the orange, the decisionmaker's methods are acceptable. If our concern is to expose the orange, the method is unacceptable. When dealing with toxic chemicals there is a critical distinction between the failure to find the orange and the conclusion that there is no orange. A mistake, uncovered years later as the layers of apples are removed, will be irreversible and potentially catastrophic.

45. W. Spitzer, et al., *New Brunswick Task Force On The Environment and Reye's Syndrome: First Report*, Submitted to the Honourable Brenda Robertson, Minister of Health at Fredericton, April 28, 1982, at p.2 (hereafter referred to as the task force report).

46. "Bird Sees Hike in Spray Area", *The Telegraph Journal*, March 19, 1982, p.1.

47. The Fenitrothion label used by Sumitomo Canada Ltd. reads in part:

NOTICE TO USER: This control product is to be used only in accordance with the direction of this label. It is an offence under the Pest Control Products Act to use a control product under unsafe conditions.

MIXING DIRECTIONS: Do not mix this product with any materials other than those listed below.

WITH OIL: To prepare Sumithion Technical liquid concentrate for use in an oil carrier with suitable specifications, such as insecticide diluent oil 585, it is necessary to add a solvent such as cyclosol 63 or Dowanol TPM. For example, when applying 280 g of active ingredient in 1.5 litres per hectare, Sumithion Technical liquid concentrate should make up 15%, cyclosol 63 or Dowanol TPM approximately 35% and diluent oil approximately 50% of the spray mixture....

WITH WATER: Sumithion Technical liquid concentrate contains no emulsifying agent. When mixing with water, sufficient quantities of a primary solvent (Dowanol TPM) and an emulsifier (Atlox 3409F) should be added. For example, when applying 210 g of active ingredient in 1.5 litres per hectare, Sumithion Technical liquid concentrate should make up 11%, Dowanol TPM 1.5% and Atlox 3409F 1.5% of the water based mixture. However, the amount of primary solvent and emulsifier used may vary slightly depending upon aircraft speed, atomization equipment, exact dosage of active ingredient and total spray volume desired per hectare.

48. Task force report, *supra*, n.45, at pp. 2-3.

49. *Ibid.*, at p.13.

50. *Ibid.*, at pp. 16, 18.

51. These recommendations are critical in that they provide a good practical example of environmental risk assessment methodology.

52. Task force report, *supra*, n.45, at pp. 4-5.

53. *Ibid.*, at pp. 5, 19-20.

54. *Ibid.*, at pp. 5-6.

55. Address to the Legislature of New Brunswick by the Premier, The Honourable Richard Hatfield, concerning the Task Force Report and the 1982 Spray Program, May 19, 1982, at p.4.

56. *Id.*

57. *Ibid.*, at pp. 8-9.

58. The spray area is usually sprayed twice. The dosage rate for 3.5 million acre block is as follows:

Fenitrothion.....3 oz/acre x 3.5 M. x 2 = 21 Million oz.
(or) 1.3 million lbs.
Cyclosol 63 Oil.....7 oz/acre x 3.5 M. x 2 = 49 Million oz.
(or) 3 million lbs.
Fuel Oil 585.....10 oz/acre x 3.5 M. x 2 =70 Million oz.
(or) 4.3 million lbs.

Total 8.6 million lbs.

The fuel oil component is 3 M. (Cyclosol)
4.3 M. (Oil 585)
7.3 million lbs.

59. Private discussions with senior officials in the federal Department of Agriculture. See also: "Health Question Results In Shelving Spray Solvent", *The Telegraph Journal*, May 27, 1982, p.1.

60. R.S.C. 1970, c.P-10, as amended; *Pest Control Products Regulations*, C.R.C., c.1253, as amended.

61. R.S.N.B. 1973, c.P-8, as amended.

62. Premier Hatfield's Report to the Legislature, *supra*, n. 55 at p.4.

63. "Spray Tested Near Fredericton", *The Daily Gleaner*, June 3, 1982, p.3. A senior official in the provincial Department of the Environment confirmed the use of Atlox in a telephone conversation with the writer.

64. Task force report, *supra*, n.45, at pp. 6-8, 20-23, 25-26.

65. *Ibid.*, at pp. 23-25.

66. *Ibid.*, at pp. 25-26.

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2. Schmidt, J.O. and W.D. Seabrook 1979. Mating of caged spruce budworm moths in pheromone environments. J. Econ. Entomol. 72:509-511.

3. Sanders, C.J. 1981. Disruption of spruce budworm mating - state of the art. In: Management of Insect Pests with Semiochemicals - Concepts and Practice. E.R. Mitchell, Ed. Plenum Press, New York.

4. Morris, O.N. 1982. Report on the 1981 Cooperative Bacillus thuringiensis (B.t.)spray trials. Forest Pest Management Institute Report FPM-X-58.

5. Clowater, W.G. and P.W. Andrews 1981. An assessment of damage caused by the spruce budworm on spruce and balsam fir trees in New Brunswick. Department of Natural Resources, Forest Management Branch.

*LETTER TO THE EDITOR

OF THE TELEGRAPH-JOURNAL

from

MARVEN SELLICK
Young's Cove Road
Jemseg, New Brunswick
E0E 1S0

August 27, 1982

*see page 43

WITHOUT SPRAY, HIS WOODLOT WAS RUINED

Dear Sir:

Three cheers for the Concerned Parents, Save Our Forests and the Conservation Council associations!(?) Through their efforts they have indirectly destroyed over 500 acres of my woodland and thousands of acres of other private woodlots. They have done this by their vocal opposition to the budworm spray programs, which in turn apparently convinced the government of this province to establish a one mile "buffer zone" from residential habitation. It should be noted that most private woodlots are within one mile of human habitation.

In 1971 I purchased a 50-plus acres a few miles from St. Stephen. This land had been cut in the latter 1960's. In 1974 this property and surrounding woodlots were "green" and growing. Just recently I walked through my woodlot and observed the adjacent ones. They are now "grey" and dead. Essentially all spruce and fir are dead and there is no second growth of softwood.

In the later 1980's I anticipated cropping my land - which would have returned over $2,500. in stumpage plus an injection to the economy - by contracting the wood cutting to a lumberman. As is stands now, with growth back to zero, I will never see a cut taken from this woodlot. I doubt if even my children will realize a cut of timber, as this land is unsuitable for a plantation, only natural regrowth.

It appears to me that the anti-spray groups are not interested in preserving the forests and the economy of the province, but only in protesting and stopping the spray program at all costs. Should the budworm spray program cease without a viable alternative to control the spruce budworm, one can expect the softwood forest industry to collapse.

Should these anti-spray groups succeed in their present compaign, I suspect their next objectives will be to try to have the use of pesticides and herbicides banned in agriculture, which would of course decimate the agriculture industry.

.../2

I urge all private landowners to inspect their woodlots and see the devastation the budworm has done to the spruce and fir; then write me advocating their support for the continuation and expansion of the spray program.

It is my desire to obtain the written support of thousands of woodlot owners and farmers, and hence form an effective organization to counteract the damaging propaganda of the anti-spray groups.

Merven Sellick